Vol. 1063 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 18, 1986

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DEPARTMENT
OF COMMERCE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 18, 1986 Volume 1063 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Feb. 15, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,373,211 through 4,374,438
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the pa-

tent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patent listed below has expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENT WHICH EXPIRED DEC. 1, 1985, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,303,154	06/225,733	12/1/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,333,527, Re. S.N. 801,920, Filed Nov. 25, 1985, Cl. 166/117.5, SIDE POCKET MANDREL AND METHOD OF CONSTRUCTION, Robert S. Higgins, et al., Owner of Record: *Otis Engineering Corp., Dallas, Tex.*, Attorney or Agent: Albert W. Carroll, Ex. Gp.: 356

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Errata

"All reference to Patent No. D278,995 to John E. Waters of Waco, Tex. for 'TRUCK TOOL BOX' appearing in the Official Gazette of May 28, 1985, should be deleted since no patent was granted.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceedas in the case of default.

Drifter Sportswear Co., Inc., Decatur, Ga., Reg. No. 1,215,951, for a Misc. design mark, Canc. No. 14,712.

ERMA S. BROWN,
Administrator, Trademark Trial and Appeal Board.

Service by Publication

A petition to cancel Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

World Cup Sports, Inc., New City, N.Y., Reg. No. 1,223,032, for the mark "WORLD CUP SOCCER CLINICS", Canc. No. 14,655.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,169,852, Franz Landauer, PROCESS FOR THE PREPARATION OF N-(CHLOROARYL)-N,N-DIALKYLAMIDINES, Interference No. 101,065, decided Dec. 19, 1985, claims 1–4.

Patent No. 4,428,946, Hector F. DeLuca, Heinrich K. Schnoes and Neal A. Jorgensen, METHOD OF PREVENTING MILK FEVER IN DAIRY CATTLE, Interference No. 101,314, decided Oct. 25, 1985, claims 1–16.

Patent No. 4,289,822, Toshikazu Shimada, Yoshifumi Katayama and Kiichi F. Komatsubara, LIGHT-SENSITIVE FILM, Interference No. 101,211, decided July 1, 1985, claims 1–7 and 21–26.

Patent No. 4,341,220, John H. Perry, STEREOTACTIC SURGERY APPARATUS AND METHOD, Interference No. 101,267, decided Dec. 10, 1985, claims 1–3, 5, 7–9, 11–17, 19–21 and 31.

Patent No. 4,352,882, Lucien G. Maury, PRODUCTION OF XANTHAN GUM BY EMULSION FERMENTATION, Interference No. 101,153, decided Nov. 25, 1985, claim 2.

Patent No. 4,356,196, Joe H. Hultquist, PROCESS FOR TREATING ALFALFA AND OTHER CELLULOSIC AGRICULTURAL CROPS, Interference No. 101,134, decided Oct. 22, 1984, claims 1 and 2.

Patent No. 4,396,535, Noel J. Bremer and Dennis E. Dria, PREPARATION OF MIXED VANADIUM PHOSPHORUS OXIDE CATALYSTS AND THEIR USE IN OXIDATIVE PROCESSES, Interference No. 101,230, decided Oct. 7, 1985, claims 7, 8 and 10.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals and Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 18, 1986

PLT. 5,574	4,526,530	4,542,497	4,550,353
4,324,859	4,527,107	4,542,850	4,551,482
4,376,110	4,529,276	4,543,280	,551,527
4,391,706	4,529,813	4,543,434	4,551,542
4,414,557	4,531,928	4,544,223	4,551,634
4,446,321	4,532,892	4,544,508	4,551,702
4,449,718	4,533,256	4,544,636	4,551,783
4,449,740	4,533,266	4,544,745	4,551,920
4,457,909	4,533,719	4,544,960	4,552,126
4,458,089	4,533,847	4,545,028	4,552,375
4,460,372	4,534,685	4,546,096	4,552,527
4,462,708	4,534,881	4,546,136	4,552,675
4,463,092	4,535,002	4,546,808	4,552,741
4,473,627	4,535,016	4,547,114	4,552,941
4,489,029	4,535,326	4,547,178	4,553,030
4,490,495	4,537,534	4,547,895	4,553,272
4,490,603	4,537,835	4,548,149	4,553,631
4,492,926	4,537,978	4,548,616	4,553,690
4,494,885	4,538,012	4,548,708	4,554,054
4,497,013	4,538,418	4,548,954	4,554,141
4,499,624	4,538,909	4,549,052	4,554,374
4,505,579	4,540,085	4,549,134	4,554,766
4,509,145	4,540,144	4,549,159	4,555,513
4,509,188	4,540,288	4,549,199	4,555,549
4,510,331	4,540,424	4,549,271	4,555,770
4,512,908	4,540,765	4,549,276	4,556,105
4,514,187	4,541,513	4,549,374	4,556,707
4,517,815	4,541,581	4,549,548	4,557,054
4,522,553	4,541,806	4,549,585	4,557,226
4,523,309	4,541,807	4,549,715	4,557,473
4,523,514	4,541,838	4,549,844	4,558,057
4,523,836	4,542,037	4,549,883	
4,525,202	4,542,351	4,550,197	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 18, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-15-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-09-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-07-85

Expiration of patents: The patents within the range of numbers indicated below expire during January 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,419,907 to 3,425,059, inclusive

Plant Patents ..... Numbers 2,856 to 2,860 inclusive

REEXAMINATIONS

FEBRUARY 18, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,564,463 (467th)

MONOLITHIC PIEZOELECTRIC FILTER HAVING MASS LOADED ELECTRODES FOR RESONATION REGIONS ACOUSTICALLY COUPLED TOGETHER

William D. Beaver, Center Valley, and Roger A. Sykes, Bethlehem, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Reexamination Request Nos. 90/000,624, Sep. 12, 1984 and 90/000,720, Feb. 7, 1985.

Reexamination Certificate for Patent No. 3,564,463, issued Feb. 16, 1971, Ser. No. 558,338, Jun. 17, 1966.

Continuation-in-part of Ser. No. 541,549, Apr. 11, 1966, abandoned. This application Feb. 7, 1985, Ser. No. 558,338

Int. Cl.[4] H03H *9/56*

U.S. Cl. 333—191

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–8** and **10–11** is confirmed.

Claims **1**, **2** and **9** were previously disclaimed.

Claim **3** is cancelled.

[1. A monolithic filter comprising, in combination, a mechanically resonant piezoelectric body having opposite faces, a first pair of opposing plate means on opposite faces of said body, a second pair of opposing plate means on opposite faces of said body, said pairs of plate means forming with said body a structure which when energized, has an equivalent lattice network with line and diagonal impedances whose respective reactance-frequency characteristics define respective resonant to antiresonant frequency ranges, said pairs of plate means having masses sufficient to confine a major portion of mechanical resonant energy applied thereto near said plate means and away from the borders of said body, said pairs of plate means having a distance between them such as to limit the interaction between said pairs and overlap the resonant to antiresonant frequency ranges, the portions of said body between said plate means being coupled acoustically as a result of the combined effect of said masses and said distance whereby energy transfer between said pairs of plate means is limited substantially to acoustic energy**]**

B1 4,288,929 (468th)

MOTION CONTROL DEVICE FOR ATHLETIC SHOE

Edward J. Norton, Kingston, N.H., and Kenneth W. Graham, Melrose, Mass., assignors to New Balance Athletic Shoe, Inc., Lawrence, Mass.

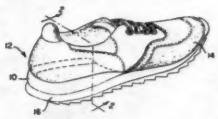
Reexamination Request No. 90/000,781, May 14, 1985.

Reexamination Certificate for Patent No. 4,288,929, issued Sep. 15, 1981, Ser. No. 112,207, Jan. 15, 1980.

Filed May 14, 1985, Ser. No. 112,207

Int. Cl.[4] A43B *23/08, 5/00*

U.S. Cl. 36—69



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3**, **5**, **6**, **8–10** and **13** are determined to be patentable as amended.

Claims **4**, **7**, **11**, **12** and **14–16**, dependent on an amended claim, are determined to be patentable.

1. For use in footwear, a control device adapted to reside **[**in a disposition above the**]** *juxtaposed an upper surface of a* sole of the footwear **[**at least in**]** *within* the region of the heel and *along the sole forwardly toward the region of the toes, said control device extending to the region of but not beyond the location of the instep of the foot to* provide support for **[**the lasted**]** *an* upper of the footwear *and the foot of the wearer to support the foot in a neutral plane and control pronation of the foot in a running cycle,* said control device including a body having a base with relatively flat upper and lower surfaces, and a wall extending upwardly from the upper surface around the heel and along both a medial and lateral side of the body, said wall throughout its length being of a height to confine the heel and along the medial side and around the heel the wall extends substantially vertically from the upper surface, and said lateral side has greater slope, said body being formed of a yieldable, but relatively sturdy material for support of the foot in **[**a**]** *said* neutral plane, and said medial wall introducing a degree of rigidity in the maintenance of a normal range of motion of the foot during **[**a**]** said running cycle.

REISSUES

FEBRUARY 18, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,083
REDUCTION OF SUPERHEATING

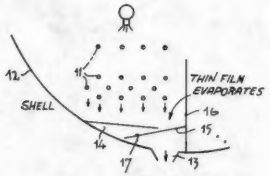
Isaih Vardi, Rehovoth; Joseph Bourne, Raanana; Jonathan Ben-Dror, Hadar Am, and Yigal Kimchi, Ramat Gan, all of Israel, assignors to Eshel Residual Energy for Cooling and Heating Ltd., Azor, Israel

Original No. 4,383,424, dated May 17, 1983, Ser. No. 246,844, Mar. 23, 1981. Application for reissue Jul. 20, 1984, Ser. No. 632,887

Claims priority, application Israel, Mar. 25, 1980, 59708

Int. Cl.[4] F25B *15/00*

U.S. Cl. 62—476 **8 Claims**



1. In an absorption refrigeration device of the type using a lithium halide/water cycle and having means defining a housing, a plurality of tubes disposed in said housing for superheating a lithium halide solution to evaporate water therefrom and form a superheated concentrated lithium halide solution, the housing having an exit port located in the lower portion of the housing for removing concentrated solution therefrom, the improvement comprising baffle means disposed between said tubes and the housing exit port for receiving the superheated concentrated lithium halide solution and flowing same over the baffle means in the form of a thin film of superheated concentrated lithium halide solution, said baffle means being comprised of a plurality of vertically stepped, horizontally extending overlapping baffles defining a tortuous pathway over which the thin film of superheated concentrated lithium halide solution flows so that further water is evaporated from the thin film as it flows over the plurality of vertically stepped, horizontally extending overlapping baffles to substantially reduce the degree of superheating of such concentrated solution and the solution flowing out of the exit port in the lower portion of the housing is of substantially reduced temperature and increased concentration.

Re. 32,084
GLYCOL ALDEHYDE AND ETHYLENE GLYCOL PROCESSES

Richard Goetz, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Original No. 4,200,765, dated Apr. 29, 1980, Ser. No. 884,877, Mar. 9, 1978. Continuation-in-part of Ser. No. 724,126, Sep. 17, 1976, abandoned. Application for reissue Oct. 4, 1983, Ser. No. 538,866

Int. Cl.[4] C07C *29/14*

U.S. Cl. 568—862 **35 Claims**

1. A process which comprises reacting formaldehyde, carbon monoxide and hydrogen in an aprotic solvent at a temperature of from about 75° C. to about 250° C. and superatmospheric pressure up to about 700 atmospheres to form glycol aldehyde in a first reaction stage and subsequently catalytically reducing the glycol aldehyde to form ethylene glycol in a second reaction stage, wherein a catalytic amount of rhodium in complex combination with carbon monoxide is present at least during said first reaction stage.

25. A process for producing ethylene glycol which comprises reacting formaldehyde, carbon monoxide and hydrogen in an aprotic solvent at a temperature of from about 75° to about 250° C. and a pressure of from about 10 to about 700 atmospheres in the presence of a catalytic amount of a catalyst comprised of rhodium in complex combination with carbon monoxide and recovering ethylene glycol from said reaction.

PLANT PATENTS

GRANTED FEBRUARY 18, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,662

PLUM TREE (JUNE BEAUT)

Norman G. Bradford, and Lowell G. Bradford, both of 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Jun. 18, 1984, Ser. No. 622,087
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of clingstone plum tree substantially as illustrated and described, which most nearly resembles its parent plant El Dorado plum, a non-intra varietal pollinator, but is distinguished therefrom and an improvement thereon in that it is a more vigorous tree and bears fruit which ripens about three to five days earlier, is somewhat larger in size, and has a darker maroon skin color.

5,663

NECTARINE TREE (JULY RED)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Jun. 18, 1984, Ser. No. 622,086
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of clingstone nectarine tree, substantially as illustrated and described, which most closely resembles Red Grand (U.S. Plant Pat. No. 1,060) nectarine but is distinguished therefrom and an improvement thereon in that it produces very heavy crops of fruit that ripen three to five days later, is larger and firmer, has a globose form, and a sweet kernel.

5,664

NECTARINE TREE (SEPTEMBER RED)

Norman G. Bradford, and Lowell G. Bradford, both of 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Jun. 18, 1984, Ser. No. 622,089
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the September Grand (U.S. Plant. Pat. No. 1,755) variety but is distinguished from and an improvement on that variety and other known late maturing varieties in having fruit which ripens about five days later than September Grand, has a more exceptional red skin color, and is firmer and remains picking ripe on the tree for approximately two weeks.

5,665

NECTARINE TREE (SCARLET RED)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Jun. 18, 1984, Ser. No. 622,090
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the Regal Grand nectarine (U.S. Plant Pat. No.1,751) but is distinguished therefrom and an improvement thereon by bearing fruit which ripens approximately two days earlier, has a brighter, redder skin color, and is almost completely globose in shape.

5,666

NECTARINE TREE (KISM GRAND)

Norman G. Bradford, 11875 E. Savana Rd., Le Grand, Calif. 95333

Filed Jun. 18, 1984, Ser. No. 622,091
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—41 1 Claim

1. A new and distinct variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the Late Le Grand nectarine (U.S. Plant Pat. No. 1,035) but is distinguishable therefrom and an improvement thereon in that the tree is more vigorous and its fruit ripens around five days earlier, has a smooth surface substantially free of russets, a redder color when picking ripe, and a better eating quality.

5,667

KALANCHOE PLANT NAMED DURANGO

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Mar. 27, 1984, Ser. No. 594,487
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Durango, as described and illustrated, and particularly characterized by its floriferous habit, producing a great abundance of brilliant orange flowers, compact growth habit, free branching, relatively early response, upright foliage, and by its adaptability to production in 10–15 cm. pots.

5,668

KALANCHOE PLANT NAMED TIJUANA

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Mar. 27, 1984, Ser. No. 594,488
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Tijuana, as described and illustrated, and particularly characterized by its bright rose red flower color and floriferous habit, compact and freely branching growth habit, and by its adaptability to production in 10–15 cm. pots.

5,669

KALANCHOE PLANT NAMED CALIENTE

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Mar. 27, 1984, Ser. No. 594,490
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Caliente, as described and illustrated, and particularly characterized by its bright red-orange flower color, compact growth habit, free branching, highly floriferous habit, and by its adaptability to production in 10–15 cm. pots.

PATENTS

GRANTED FEB. 18, 1986

ERRATA

For CLASS	See PATENT NO.
623–018	4,570,271
034–232	4,570,367
178–002	4,570,565
123–288	4,570,611
229–017	4,570,788
272–137	4,570,921
332–016	4,571,549

PATENTS

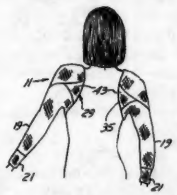
GRANTED FEBRUARY 18, 1986

GENERAL AND MECHANICAL

4,570,266
STRAND GARMENT AND METHOD OF FABRICATING SAME
Cynthia M. Schlosser, 173 Meador Way, SE, Atlanta, Ga. 30315
Filed Feb. 25, 1985, Ser. No. 705,021
Int. Cl.[4] A41D *3/08, 1/22, 1/04, 1/14*
U.S. Cl. 2—69 **10 Claims**

9. A garment comprising a set of loosely juxtaposed strands of yarn, tape means attaching the strands together at opposite ends thereof, and means for suspending said set of strands from a human body.

4,570,267
UNISEX TORSO GARMENT WITH SLEEVES
Bette J. Appel, Rochester, Mich., assignor to Bette Appel, Inc., Bloomfield Hills, Mich.
Filed Aug. 27, 1984, Ser. No. 644,846
Int. Cl.[4] A41D *23/00*
U.S. Cl. 2—91 **6 Claims**

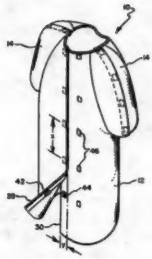


1. A unitary tubular garment for selectively covering the front or back upper torso and arms of the wearer, said garment comprising a torso engaging panel of a fabric material;

a pair of opposed sleeves continuous with said panel and, at their inner ends, being of maximum circumference extending from and merging with opposite sides of front panel as a continuation thereof, and tapering laterally outward;

the portions of the sleeves adjacent said panel being open at their inner ends defining a central opening and at their upper and lower boundaries merging respectively with the top and bottom of said panel the portions of said sleeves adjacent said central opening each including an outwardly converging triangular gusset having a base in alignment with the edges defining said central opening and stitching interconnecting the converging edges of each gusset with the adjacent edge portions of each of said sleeves.

4,570,268
PATIENT'S GARMENT
James J. Freeman, 19 Willowlawn Ave., Buffalo, N.Y. 14214
Filed Dec. 7, 1983, Ser. No. 558,799
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—114 **14 Claims**



1. A patient's garment which may be worn with comfort and dignity as either a housecoat or a gown and which is suitable for use for prolonged convalescence, the garment also permitting a wide variety of medical procedures, such as X-ray, to be performed without removal of the garment and which will also permit continuation of medical procedures while the garment is being removed; said garment comprising:

a body portion which is adapted to be worn about the upper abdomen and thorax of a patient and extend from the patient's neck to about the knees of the patient, the body portion including a main panel adapted to cover one side of a patient and a pair of adjacent side panels adapted to cover the other side of the patient, each of the side panels having a generally vertically extending marginal edge, the main panel and side panels having a lower edge and an upper edge, the upper edge having sleeve-attaching sections and neck opening defining sections;

first and second columns of vertically spaced apart X-ray transparent panel fasteners mounted on the side panels adjacent the marginal edges and being capable of holding the side panels together in overlapping relationship;

a third column of vertically spaced apart X-ray transparent panel fasteners mounted on one of the side panels in parallel relationship to one of the columns of vertically spaced apart panel fasteners, the third column of panel fasteners being capable of cooperating with the other one of said first and second columns of panel fasteners to permit the girth of the garment to be varied;

a pair of sleeves, each sleeve having an upper sleeve edge, parallel side edges, and a lower edge, at least a portion of the upper sleeve edge being secured to the sleeve-attaching section of the upper edge of the panels of the body portion, the parallel side edges normally extending from the patient's neck over the patient's shoulder and down the arm of the patient to the lower sleeve edge, and the lower sleeve edge normally being disposed at a location below the patient's antecubital fossa; and

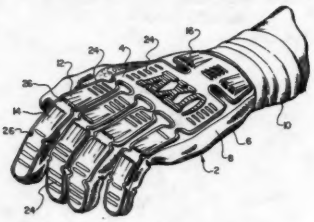
first and second columns of spaced apart X-ray transparent sleeve fasteners mounted on each sleeve adjacent the parallel side edges and capable of holding the parallel side edges of the sleeve together in overlapping relationship in a normal position, said sleeve fasteners being of the type having cooperating hook-forming pile threads and loop forming pile threads and which can be quickly secured together through the application of pressure and which can be quickly released through the application of a moderate pulling force.

4,570,269

RACING GLOVE

Remo Berlese, 31036 Via Ospedaletto Di Istrana (TV), Via Castellana Z.I., Italy

Filed Nov. 12, 1984, Ser. No. 675,814
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A **21 Claims**



1. A vented racing glove comprising:
an inner glove having hand and finger portions,
an outer pad of flexible protective material attached to and overlying at least some of the fingers on the upper side of the glove, and
a plurality of upstanding air scoops formed integrally with the pad on at least some of the finger portions of the pad, each of said air scoops including a raised air inlet which is oriented generally forward when the wearer grasps a motorcycle handlebar and directs a generally rearward flow of air into the underside of the pad in response to forward motion of the motorcycle.

4,570,270

POLYURETHANE COMPOSITIONS AND THEIR USE AS LUTING AGENTS

Sixtus J. Oechsle, III, 3907 Henry Ave., Philadelphia, Pa. 19129

Division of Ser. No. 419,999, Sep. 20, 1982, Pat. No. 4,477,604. This application Aug. 3, 1984, Ser. No. 637,714
Int. Cl.[4] A61F *1/24*
U.S. Cl. 2—18 **3 Claims**

1. A process for inserting a prosthesis into a medullary cavity in a human being or other animal comprising the steps of:
(a) intimately admixing a pharmaceutically acceptable poly(urea)urethane-forming prepolymer and a curing agent and filler;
(b) promptly pouring the reactants set forth in step (a) into the medullary cavity;
(c) inserting a prosthesis; and
(d) completing the insertion of prosthesis, and closing the incision made to permit the procedure, within a period in the range from about five to about ten minutes after the reactants are admixed.

4,570,271

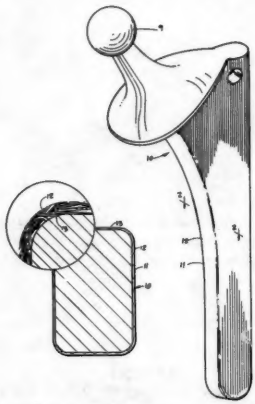
POROUS COATINGS FROM WIRE MESH FOR BONE IMPLANTS

Kenneth R. Sump, Richland, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 287,431, Jul. 27, 1981, abandoned. This application Dec. 14, 1983, Ser. No. 561,577
Int. Cl.[4] A61F *1/24*
U.S. Cl. 623—18 **9 Claims**

1. A bone implant element for tissue ingrowth applications having a porous matrix coating directly bonded to a preselected metallic surface area thereof, the coating having interconnected pores through which soft and hard living tissues can grow after implantation of the bone implant element;
the coating being produced by the following steps:
overlaying the preselected surface area with a preform covering formed of a plurality of layers of continuous metallic wire mesh made from a material compatible with the material of the surface area and having a total material thickness equal to a desired preform coating thickness;
compressing the covering against the preselected surface area by subjecting it to compressive forces capable of accurately deforming the surface areas of the covering to the desired coating thickness to achieve a reproducible porous coating; and
heating the compressed covering while under pressure to an elevated temperature at which diffusion bonding occurs between all areas of contact between the wires in the wire mesh and also between the surface area and all areas of contact of the wires that engage it.

2. A method for producing a porous matrix coating directly bonded about a preselected metallic surface area of a bone implant element for tissue ingrowth applications, comprising the following steps:



overlaying the preselected surface area with a preform covering formed of a plurality of layers of continuous metallic wire mesh made from a material compatible with the material of the surface area and having a total material thickness equal to a desired preform coating thickness;
compressing the covering against the preselected surface area by subjecting it to compressive forces capable of accurately deforming the surface areas of the covering to the desired coating thickness to achieve a reproducible porous coating; and
heating the compressed covering while under pressure to an elevated temperature at which diffusion bonding occurs between all areas of contact between the wires in the wire mesh and also between the surface area and all areas of contact of the wires that engage it to produce a porous coating having interconnected pores through which soft and hard living tissues can grow after implantation of the bone implant element.

4,570,272

TOILET BOWL FLUSHING DEVICE

Shojiro Kawaguchi, and Kuniyuki Odaka, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jul. 31, 1984, Ser. No. 636,406
Claims priority, application Japan, Aug. 11, 1983, 58-147087
Int. Cl.[4] E03D *13/00*
U.S. Cl. 4—302 **3 Claims**

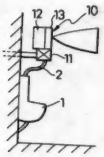
1. A toilet bowl flushing system, comprising:
(a) an electromagnetic valve means including means for discharging a low flow-rate of flushing water to said bowl and

means for discharging a high flow-rate of flushing water to the bowl;

(b) means for detecting approach and departure of users of said bowl, said detecting means generating an ON signal indicative of said approach and initiation of use of said bowl by a first user, a first OFF signal indicative of said departure and termination of use of said bowl by said first user, a second OFF signal indicative of approach of a second user immediately after departure of said first user, and a third OFF signal indicative of departure of said second user; and

(c) means for controlling operation of said valve means, including

(1) first means responsive to said ON signal from said detecting means for energizing said high flow-rate water discharging means for a relatively short first period of time upon said initiation of use by said first user;



(2) second means for energizing said low flow-rate discharging means in response to said ON signal and said high flow-rate water discharging means in response to said first OFF signal, said high flow-rate discharging means being energized for a second period of time longer than said first period of time, and said low flow-rate discharging means being deenergized a predetermined period after deenergization of said high flow-rate discharging means;

(3) third means responsive to said second OFF signal occurring during said second period of time for deenergizing said high flow-rate discharging means, thereby to interrupt the high flow in said bowl during use by said second user; and

(4) fourth means responsive to said third OFF signal for reenergizing said high flow-rate water discharging means for said second period of time following departure of said second user.

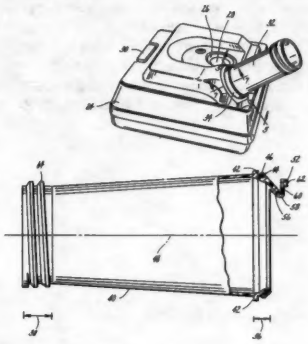
4,570,273

PORTABLE TOILET POURSPOUT

John M. Antos, Ann Arbor, and John Selina, Ypsilanti, both of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Dec. 29, 1983, Ser. No. 566,650
Int. Cl.⁴ E03D *1/00*
U.S. Cl. 4—321 **12 Claims**

1. A pourspout accessory kit for use with a portable toilet having a holding tank to facilitate dumping of the contents of the holding tank via an outlet opening in the holding tank, said accessory kit comprising a pourspout having an inlet end for attachment to the outlet opening of a holding tank, an outlet end spaced from said inlet end, an inlet end closure cap for removably closing said inlet end, an outlet end closure cap for removably closing said outlet end, integral flange means extending circumferentially around the pourspout adjacent its inlet end, sealing means for extending circumferentially around the pourspout to a side of said flange means toward the inlet end of the pourspout, integral bayonets projecting from the inlet end of the pourspout for attachment to a holding tank internally of the holding tank's outlet opening, said bayonets being enclosed by said inlet end closure cap with the latter disposed closing said inlet end, said inlet end closure cap removably attaching to the inlet end of said pourspout via said flange means and also enclosing said sealing means with the latter disposed circumferentially around the pourspout to the side of said flange means toward the inlet end of the pourspout, and a separate annular retainer for passing onto the pourspout via said outlet end along the length of the pourspout to said inlet end, said retainer having a cooperative engagement with



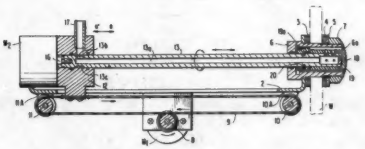
said flange means providing for attachment to the holding tank externally of the holding tank's outlet opening when said inlet end closure cap is removed from the pourspout inlet end.

4,570,274

DEVICE FOR WASHING POSTERIOR PARTS OF HUMAN BODY

Kenichi Kaneko, Kariya; Yuji Hirashiba; Shinji Kawai, both of Toyota, and Koichi Suzuki, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Sep. 28, 1984, Ser. No. 655,613
Int. Cl.⁴ E03D *9/08*
U.S. Cl. 4—443 **5 Claims**



1. A device for washing the posterior parts of the human body, the device comprising:

a nozzle means extending in a toilet bowl so as to be movable forward and backward;

an electric motor operated driving means for moving the nozzle means either to a position for washing the anal area or to another position for washing the female genitals, the driving means further acting to move the nozzle means forward or backward within a given range according to the instruction from the user after the nozzle means has halted in one of the two positions;

a tank for storing warm water; and

a pressure means for forcing cold water into the tank so that the warm water driven out of the tank may be ejected from the ejection hole of the nozzle means.

4,570,275

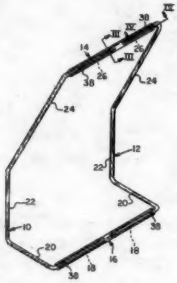
BEDDING SUPPORT

Henry H. Merriman, Apt. C101, 3400 Carpenter Rd., Ypsilanti, Mich. 48197

Filed Oct. 17, 1984, Ser. No. 661,729
Int. Cl.⁴ A47C *21/02*
U.S. Cl. 5—505 **3 Claims**

1. A bedding support for use with a bed having a mattress for supporting bedding above the mattress comprising, in combi-

nation, first and second rigid elongated configurated frame elements, said elements being a mirror image of each other and each including a horizontally disposed lower end section adjacent a horizontally disposed support section transversely oriented to the adjacent end section, a column section vertically extending from said support section having a length at least as great as the mattress thickness, a mattress overlay section extending from said column section and an upper end section transversely depending from said overlay section, said lower



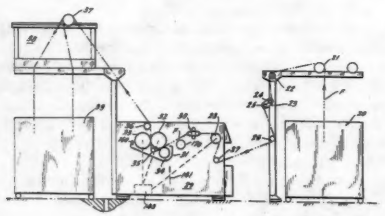
and upper end sections of said first and second elements, respectively, extending toward each other and in longitudinal alignment with each other, elongated tubular connectors having open ends, said aligned lower and upper end sections being slidably received within opposite ends of a connector permitting longitudinal adjustment therein, and friction producing means interposed between said connectors and the end sections received therein comprising inwardly extending elements defined upon said connectors frictionally engaging the associated frame element end sections.

4,570,276

METHOD FOR PAD BATCH DYEING OF TUBULAR KNITTED COTTON FABRICS

John R. Sellers, Davidson, N.C., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Division of Ser. No. 596,615, Apr. 4, 1984, Pat. No. 4,532,782.
This application May 28, 1985, Ser. No. 737,693
Int. Cl.⁴ D06B *3/18*
U.S. Cl. 8—151 **4 Claims**



1. The method of dyeing tubular knitted fabric having a cotton content of at least about 50%, which comprises

(a) providing a supply of the tubular knitted fabric,

(b) flattening said fabric and placing said fabric under slight initial lengthwise tension,

(c) positively and controllably advancing said fabric by driving the fabric across its full width,

(d) immediately thereafter engaging said tubular knitted fabric internally by its edges and spreading said fabric substantially to but not substantially beyond its natural greige width,

(e) guiding said spread tubular knitted fabric at a slight downward angle directly into a body of treating solution and through a single submerged treating nip,

(f) subjecting the fabric to predetermined rolling pressure in said submerged nip,

(g) guiding the fabric from said submerged nip to and around a submerged guide roller, and then guiding the fabric from said guide roller in a generally vertical direction,

(h) advancing the fabric generally vertically upward out of the treating solution,

(i) immediately thereafter subjecting said fabric to predetermined rolling pressure at a squeeze nip formed by opposing resilient squeeze rollers at a level slightly above the level of said treating solution, and

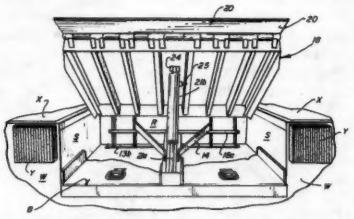
(j) causing the lower surface portions of said squeeze rollers to pass through said treating solution immediately in advance of applying said rolling pressure.

4,570,277

LEVELER ASSEMBLY

Norbert Hahn, South Milwaukee, and Michael A. Swessel, Cudahy, both of Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed May 21, 1984, Ser. No. 612,439
Int. Cl.⁴ E01D *1/00*
U.S. Cl. 14—71.3 **10 Claims**



1. A leveler assembly for use within a pit formed in the platform surface of a loading dock, the pit having substantially horizontal recessed base surface, side and rear walls extending upwardly therefrom, and an open front and top; said assembly comprising a stationary frame adapted to be fixedly anchored within the pit, said frame including an upright section positionable adjacent the pit rear wall, and a single forwardly extending narrow section affixed to said upright section and mountable on the pit base surface and terminating at substantially the pit open front, the terminating end of the narrow section being free of any other segment of the frame, said narrow section effecting segregation of the pit base surface into a pair of large contiguous substantially unobstructed areas, each area being defined in part by the pit open front; and a deck member hingedly mounted on said frame upright section for normally assuming a neutral position of hinged adjustment whereby said deck member simultaneously overlies the contiguous areas and the exposed surface of said deck member is substantially coplanar with the dock platform surface; the segregated areas of the pit base surface being exposed and accessible for removing debris therefrom through the pit open front when the deck member assumes a predetermined upwardly hinged position.

4,570,278

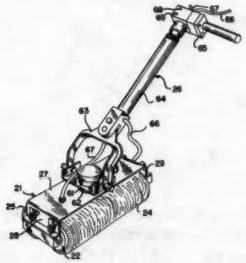
PORTABLE POLISHER AND BUFFS THEREFOR

James A. Bloome, Blue Grass; Rick A. Meeker, Davenport; Jerry T. Whicker, Bettendorf, all of Iowa, and Frederick J. Foreman, Pittsburgh, Pa., assignors to The Kartridg Pak Co., Davenport, Iowa

Continuation-in-part of Ser. No. 469,756, Feb. 25, 1983, Pat. No. 4,499,624. This application Jul. 17, 1984, Ser. No. 631,625

Int. Cl.⁴ B64F *5/00*; A47L *11/03*

U.S. Cl. 15—97 R **30 Claims**



1. A polishing roll buff assembly for a polishing apparatus including an elongated drive arbor depending from and rotatably mounted with respect to a frame assembly, said elongated drive arbor having a peripheral surface and an elongated longitudinal axis, said elongated longitudinal axis being generally parallel to the surface of the substrate being prepared by the apparatus, the improvement comprising said polishing roll buff assembly including:

an elongated, disposable cylinder having an internal diameter greater than the external diameter of said elongated, cylindrically shaped driven arbor of the polishing apparatus;

a plurality of fabric disks assembled onto and generally along the length of said elongated, disposable cylinder;

said plurality of fabric disks are positioned adjacent to each other and are axially compressed together, said disks having been affixed to said elongated, disposable cylinder while said disks had been so axially compressed to form an axially compacted buff assembly; and

said axially compacted buff assembly has an axial compression of at least about 5 percent and up to about 15 percent of the total length of the fabric disks when uncompacted.

4,570,279

APPARATUS FOR CLEANING GLASS MASKS

Takeshi Yoshizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

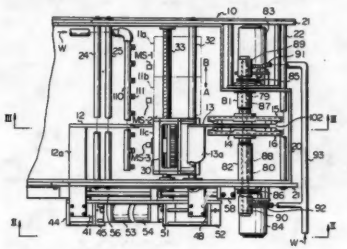
Continuation-in-part of Ser. No. 152,557, May 23, 1980, abandoned. This application Oct. 3, 1983, Ser. No. 406,856

Claims priority, application Japan, May 28, 1979, 54-71625

Int. Cl.⁴ B08B *11/02*

U.S. Cl. 15—97 R **6 Claims**

1. An apparatus for cleaning glass masks, comprising: a pair of rotary cleaning elements confronting each other including a pair of sponge discs each secured respectively to a horizontally rotating shaft, said pair of sponge discs having end surfaces confronting each other, said end surfaces being used for wiping both surfaces of the glass mask held in said position therebetween, and said cleaning elements further including liquid flow means for pouring liquid therebetween; supporting means for supporting a cassette in which a plurality of glass masks are contained; and carriage means including pinching means for pinching each of respective glass masks by pressing a pair of opposed edges of the same, and carrying means for carrying the glass masks, one by one, to a position between said cleaning elements, in which position both surfaces of the glass mask are



wiped by the cleaning elements and washed by the liquid poured from the liquid flow means.

4,570,280

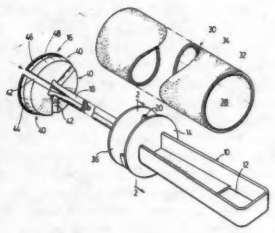
ONE PIECE LINT ROLLER SUPPORT

Eric M. Roth, 153 Lake Dr. N., N. Ontario, Canada (L4P 3C8)

Filed Nov. 5, 1984, Ser. No. 667,980

Int. Cl.⁴ A47L *25/00*

U.S. Cl. 15—104 A **3 Claims**



1. Integrally molded support for adhesive roll sleeve comprising:

a support member and a handle integrally extending therefrom;

said support member having a longitudinally extending shank,

means at the handle-adjacent end of said shank for rotatably supporting the inward end of an adhesive roll sleeve and for limiting movement of such sleeve toward said handle,

means at the handle-remote end of said shank for rotatably supporting the outward end of such adhesive roll sleeve and for limiting movement of such sleeve away from said handle,

said means at the handle-remote end comprising a plurality of guide members angularly disposed about the axis of rotation of said sleeve, each providing a radially outwardly facing support surface and a flange located at the handle remote edge of said support surface and radially outwardly directed therefrom; said support surfaces collectively being designed to collectively rotatably support the outward end of said sleeve and said flange being designed to collectively limit movement of said roller away from said handle,

said guide members being shaped so that their radially inward deflection moves said flanges inward to allow said sleeve to pass outwardly thereover,

said guide members being resiliently deflectably connected to said shank,

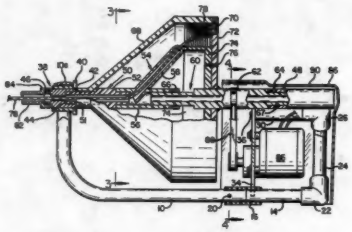
said guide members being provided with digitally engageable surfaces facing away from said handle and located radially inwardly of said flanges.

4,570,281

ROTARY DRAIN CLEANER

David A. Boelens, 2805 N.E. 117th Ave., Portland, Oreg. 97201

Filed Mar. 22, 1984, Ser. No. 592,024
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.3 SN **5 Claims**



1. A rotary drain cleaner comprising:
(a) a frame having front and rear ends,
(b) front and rear spaced bearings supported on the frame,
(c) a telescoping, segmented shaft supported on the bearings, the shaft comprising:
(1) a front axle segment journaled in the front bearing and having an axial bore therethrough,
(2) behind the front axle segment a freely rotatable guide segment for guiding a plumber's snake, the guide segment comprising a hollow tubular member telescopically coupled freely at its front end to the front axle segment, and an angularly extending hollow snake guide secured to and communicating with the hollow tubular member intermediate the ends of the latter,
(3) behind the guide segment a drum-supporting segment telescopically coupled freely at its front end to the rear end of the hollow tubular member of the guide segment,
(4) on the drum-supporting segment a rear axle journaled in the rear bearing,
(d) a cage fixed at its front end to the front axle segment and at its rear end to the drum-supporting segment of the shaft,
(e) a drum within the cage fixed to the drum-supporting segment and the cage and defining a restricted annular space between the cage and drum in which to confine a coiled plumber's snake, and
(f) a motor connected to the drum-supporting segment of the shaft for rotating the drum-supporting segment and the front axle segment.

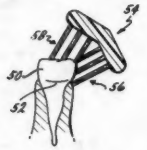
4,570,282

TOOTHBRUSH

Martin H. Kaufman, 4530 W. Ridgecrest Blvd., Ridgecrest, Calif. 93555; Chris A. Cerceo, and Jeanie F. Kaufman, both of 3443 Lake Tahoe Blvd., South Lake Tahoe, Calif. 95705

Continuation-in-part of Ser. No. 424,075, Sep. 27, 1982, abandoned, and a continuation-in-part of Ser. No. 451,039, Feb. 22, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,814
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167 R **15 Claims**

12. A toothbrush comprising:
means for grasping;
means for brushing mounted on said means for grasping and including an elongated base element having a longitudinal axis and mounting a plurality of bristle elements for cleaning teeth extending generally transversely to said longitudinal axis, one end of said bristle elements being affixed to said base element and the other end of said bristle elements being free, said free ends defining together a tooth receiving channel means for receiving a tooth and guiding said means for brushing so that said free ends on one side of said channel means contact the side of a tooth at a predetermined acute angle, said tooth receiving channel means having generally a V-shaped configuration, said bristle elements being arranged generally in two banks with the free ends of said bristle elements in a first bank extending convergingly with the free ends of said bristle elements in a second bank at an acute included angle of from about 10 to 55 degrees, said base element being unbroken between said banks and supporting said bristle elements in fixed relationship to one another, the bristle elements in each said bank being arranged generally in rows, said rows extending substantially transversely to said longitudinal axis, bristle means for defining a stiff apex cleaning element, said bristle means including the laterally innermost bristle elements of the rows in each of said banks, said laterally innermost bristle elements in said first and second banks abutting one another for at least approximately one quarter of their length, the laterally outermost ones of said bristle elements having a first length, the bristle elements forming said stiff apex cleaning element having a length of from about one quarter to seven tenths that of said first length.

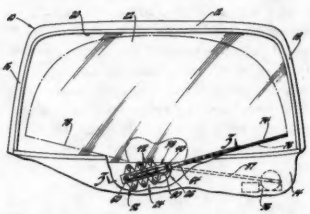


4,570,283

VARIABLE REACH WINDSHIELD WIPER SYSTEM

John R. Osterday, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1985, Ser. No. 706,789
Int. Cl.[4] B60S *1/26*
U.S. Cl. 15—250.21 **4 Claims**



1. A wiper system for a window on a vehicle body comprising, a transmission shaft disposed on said vehicle body for angular oscillation about an axis of said body through a wipe arc, a plurality of links pivotally connected together to define a scissors linkage having an anchor pivot at one end and a driven pivot at the other end and a control pivot between and colinear with said anchor and said driven pivots, means mounting said scissors linkage at said anchor pivot thereof on said transmission shaft for angular movement relative thereto in a plane perpendicular to said axis, control means on said body engageable on said scissors linkage at said control pivot operative in response to angular movement of said scissors linkage to displace said control pivot radially relative to said anchor pivot whereby said driven pivot is proportionately radially displaced in the same direction, a support arm having a wiper thereon engaging said window, means mounting said support arm on said transmission shaft perpendicular to and intersecting said first axis for angular oscillation therewith whereby

said wiper is moved across said window through said wipe arc and for longitudinal bodily shiftable movement relative thereto whereby the reach of said wiper is varied, and means connecting said scissors linkage at said driven pivot thereof to said support arm so that said scissors linkage moves angularly about said axis with said support arm while radially displacing the latter to vary the reach of said wiper.

4,570,284

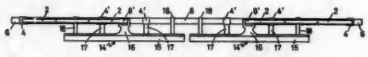
WIPER BLADE WITH AIR DEFLECTING DEVICE

José Verton, Saint-Vincent, Belgium, assignor to Champion Spark Plug Europe S.A., Virton, Belgium

Filed Aug. 8, 1984, Ser. No. 638,971

Int. Cl.[4] B60S *1/38*

U.S. Cl. 15—250.42 12 Claims



1. A wiper blade for motor vehicles or the like which includes a wiping element attached to a superstructure for transmitting pressure from a wiper arm to the wiping element, the superstructure comprising:

an elongated main bridge;

at least one intermediate yoke;

articulated means for attaching the intermediate yoke to the main bridge;

at least one air deflecting device attached to the wiping element; and

articulated means for attaching the air deflecting device to the intermediate yoke.

4,570,285

WIRE ROPE CLEANING DEVICES

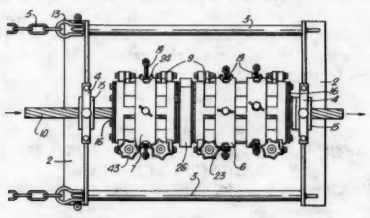
Alan W. Skelton, 103 Shaftesbury Way, Twickenham, Middlesex TW2 5RW, England

Filed Dec. 9, 1983, Ser. No. 559,924

Claims priority, application United Kingdom, Dec. 10, 1982, 8235318

Int. Cl.[4] D02J *7/00*

U.S. Cl. 15—256.6 14 Claims



1. A wire rope or cable cleaning device, wherein said rope is stranded with helical grooves between said strands, comprising:

an anchoring frame having a first end through which a rope can pass into said frame and having a second end through which a rope passes out of said frame, at least one split collar positioned within said frame,

means for closing said collar around a rope, said collar forming a sleeve around a rope and having a rope receiving end and a rope discharge end, said discharge end of said collar abutting the interior surface of said second end of said frame,

means for mounting inwardly directed tools having a rope engaging surface and allowing independent rotatation of said tools within said collar about an axis perpendicular to a rope, and

means for anchoring the frame against the pull of a rope as it passes through said collar.

4,570,286

PORTABLE VACUUM CLEANING DEVICE

David Ross, 1 Louisiana Ave., Lakehopatcong, N.J. 07849

Division of Ser. No. 428,650, Sep. 30, 1982, Pat. No. 4,476,607.

This application Jul. 17, 1984, Ser. No. 631,756

Int. Cl.[4] A47L *5/36*

U.S. Cl. 15—327 C 16 Claims

1. A portable operator carried vacuum cleaner for cleaning surfaces, comprising:

an elbow-shaped housing having a first leg and a second leg;

vacuum blower means located within the first leg of said housing for creating a vacuum in said housing;

filter bag means, located within the second leg of the housing, for trapping matter drawn into said vacuum cleaner by said vacuum generated by said vacuum blower means; and

carrying means attached to said housing for assisting the operator in carrying said vacuum cleaner during vacuuming, the carrying means comprises first and second securing ears and a carrying strap, the first securing ear is mounted on the first leg of the housing and the second ear is mounted on the second leg of the housing, the carrying strap is attached to the ears and is so constructed that the first leg of the housing extends generally vertically in a downward direction from the second leg of the housing which extends generally horizontally during a vacuuming operation.

4,570,287

METHOD OF AND APPARATUS FOR PICKING UP REFUSE FROM A SURFACE, SUCH AS A TRACK BED

Engelbert Kerschner, Leichlingen, and Edgar Muschelknautz, Leverkusen, both of Fed. Rep. of Germany, assignors to Walter Schneider GmbH & Co. KG, Witzhelden, Fed. Rep. of Germany

Filed May 23, 1984, Ser. No. 613,601

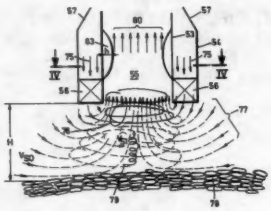
Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318756

Int. Cl.[4] E01H *1/08*

U.S. Cl. 15—346 21 Claims

1. Apparatus for picking up refuse from a surface, such as the ballast bed of a railroad track, comprising: a wheeled vehicle, means located on said vehicle for genera a flow of air, first duct means in said vehicle having a first end and a second end with the first end positioned adjacent said means for generating a flow of air for providing a suction action within said first duct means and the second end forming a suction port positioned above the surface to be cleaned, second duct means within said vehicle having a first end and a second end with said first end

arranged to receive a flow of air from said means for generating a flow of air and said second end located at the second end of said first duct means, guide means in the second end of said second duct means for directing the air flow out of said second duct means in a downwardly directed circular flow path



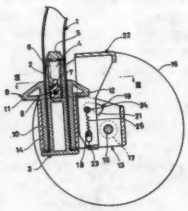
around a downward projection of said suction port so that the circular flow path of the air sweeps over the surface to be cleaned and refuse swept up by the flow of air is drawn inwardly and upwardly by the suction action within said first duct means flowing through said suction port.

4,570,288

SPRING SUPPORTED CASTER HAVING A DISENGAGEABLE SWIVEL LOCK

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Nov. 8, 1984, Ser. No. 669,536
Int. Cl.[4] B60B *33/02*
U.S. Cl. 16—35 R **6 Claims**



1. A caster for baby carriages, adapted to be attached to the lower end of a leg (1) of a baby carriage, characterized in that:

at least the lower end of said leg (1) is fabricated of a hollow pipe and is vertically directed,

a rotary yoke (13) held by the lower end of the leg (1) and supporting the axle (16) of a wheel (15) at a position deviated from the central axis of the lower end of said leg (1) is installed to surround the lower end of said leg (1) so that it is rotatable around the central axis of the lower end of the leg (1) and is vertically movable,

the lower end of said leg (1) is provided with a vertically extending elongated hole (2),

a cushion effect applying member (7, 8, 9) outwardly extends from within the lower end of said leg (1) through said elongated hole (2) to engage said rotary yoke (13) from above, and

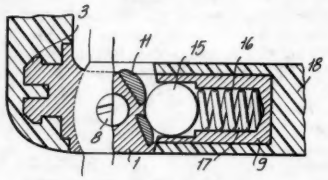
a cushion spring (6) is installed in the lower end of said leg (1) to impart a downward force to said cushion effect applying member.

4,570,289

RESILIENT SPECTACLES HINGE AND METHOD FOR MAKING A SPECTACLES FRAME BEARING A RESILIENT SPECTACLES HINGE

Piero Consolati, Via Aselli, 23, 20100 - Milano, Italy

Filed Jul. 25, 1983, Ser. No. 516,885
Claims priority, application Italy, Jul. 30, 1982, 22691 A/82
Int. Cl.[4] G02C *5/22*; B21D *53/40*
U.S. Cl. 16—228 **9 Claims**



1. The method of making a spectacles frame having a front portion, having plate members, having side arms connected to said front portion, and a hinge for pivotally securing one of said side arms to one of said front portion, said frame bearing cam surfaces for resiliently holding each of the side arms to the front portion, which method comprises the steps of forming plate members; providing each of the plate members with a contoured edge; providing said edge with a plurality of bores; anchoring a cup member made of hard material in each of said bores, which anchored cup members provide said cam surface; forming in the end of each side arm, a ball seat positioned such that said seat is adjacent said front portion when the frame is assembled; inserting a ball member in said seat after inserting a spring in said seat to bias said ball and to urge said ball into contact with said cam surfaces; said plate, said arms, and said front portion being made of a material different from the material of said cup members, said plate member being housed in a portion of the spectacles frame.

7. A hinge for resiliently coupling the side arm to the front portion of a spectacles frame, which hinge comprises a plate having a cam surface, said plate having bores with cup members anchored in said bores thus forming said cam surface, said cup members being made of hard material, said arm housing a ball and a spring which biases said ball into contact with said cup members, said plate, said front portion, said side arm being made of a material other than the material of said cup members, prepared by the method of claim 1.

4,570,290

HINGE HAVING A LATERALLY OUTWARDLY EXTENDING FLAT SPRING

John P. Anderson, Ontario, Calif., assignor to Hartwell Corporation, Placentia, Calif.

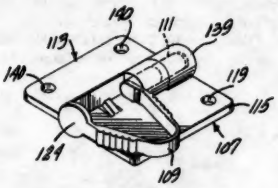
Continuation of Ser. No. 415,336, Sep. 7, 1982, abandoned, which is a continuation-in-part of Ser. No. 284,922, Jul. 20, 1981, Pat. No. 4,455,711. This application Dec. 14, 1984, Ser. No. 682,565
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.[4] E05D *7/10*
U.S. Cl. 16—229 **10 Claims**

1. A quick release hinge/latch comprising

a housing having a first tube thereon;

a pin adapted to slide within said first tube and including a flat spring integrally formed therewith having a first end fixed relative to said housing and a second end integral with said pin, said pin and spring being of one piece construction, said flat spring biasing said pin axially outwardly of said first tube and extending laterally outwardly

of said tube from each said end of said flat spring for manual gripping between said ends laterally outwardly of



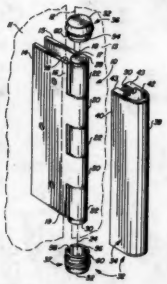
said tubes to compress said flat spring and retract said pin into said first tube.

4,570,291

COVER FOR BUTT-HINGES

Gilbert C. Smith, P.O. Box 13484, Phoenix, Ariz. 85002, and Bruce J. Cann, 505 W. Baseline Rd., Tempe, Ariz. 85282

Filed Jul. 16, 1984, Ser. No. 631,246
Int. Cl.[4] E05D *11/00*
U.S. Cl. 16—250 21 Claims



1. A cover for and in combination with a butt-hinge of the type having an axis, a pair of leaf members for mounting on a swinging door and a door casing with the leaf members having extending side portions and plural knuckles which are pivotably interconnected by a pintle for movement between a closed position wherein the leaf members are in juxtaposed relationship and an open position wherein the leaf members are in approximately a 180° relationship with each other, said side portions having edge surfaces extending perpendicular to the hinge axis, said cover comprising:

(a) an elongated one piece cover body for mounting on the butt-hinge, said cover body including opposite longitudinal edges extending perpendicular to the hinge axis, said body having an arcuate in cross section hump portion for covering all of the plural knuckles of the butt-hinge, said cover body further including a pair of bendable scraps which extend integrally and outwardly from the opposite longitudinal edges of the hump portion thereof, said straps being about to be in contiguous overlaying engagement with the surfaces of the extending side portions of the leaf members; and

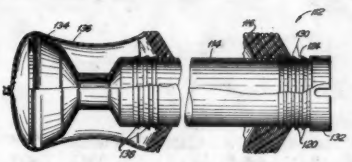
(b) said cover body being formed of an elastomeric material and movable with the hinge between a relaxed state wherein said cover body lies in a substantially flat plane when the hinge is in the open position thereof and a taut state wherein said cover body is wrapped around the knuckles of the hinge in a folded configuration when the hinge is in the closed position thereof.

4,570,292

TUBULAR CORE FOR A SHIRRED CASING ARTICLE

Rodney L. Wallace, Brookfield, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 14, 1983, Ser. No. 561,229
Int. Cl.[4] A22C *13/02*
U.S. Cl. 17—1 R 7 Claims



1. A tubular core suitable for use as a sleeve to be mounted over a stuffing horn or for use as a disposable stuffing horn of a stuffing machine, and disposed on the tubular core a shirred casing stick having the pleats thereof in gripping engagement about the tubular core, and the tubular core having an aft end and a fore end and having on an aft end portion thereof means permitting the one way passage of the shirred casing stick onto the tubular core over said aft end portion;

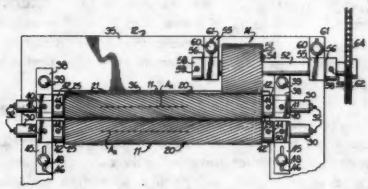
said means providing said aft end portion with a generally serrated profile, each serration of which is formed by a first surface extending outward from the tubular core and inclined in a direction towards said fore end of the tubular core, and a second surface which is more normal to the tubular core than said first surface, and said second surface comprising a part engageable against the pleats of an adjacent part of the shirred casing stick for resisting the longitudinal movement of said pleats along the tubular core towards said aft end.

4,570,293

PEELER ROLL CONSTRUCTION

Grover S. Harben, Jr., Edgewater Ave., Gainesville, Ga. 30501, and Robert J. Sosebee, Rte. 1, Gillsville, Ga. 30543

Filed Jan. 3, 1984, Ser. No. 567,737
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 7 Claims



1. A peeler roll construction adapted to be used in pairs for removing the lining from gizzards comprising a solid toothed roll having opposed ends and defining helically extending teeth around the periphery thereof adapted to drivingly engage another of said toothed rolls complimentary thereto to remove the linings from gizzards, said toothed roll defining a pair of bores therein in the opposite ends thereof of a prescribed depth, each of said bores located concentrically of the central axis of said roll and opening onto the end of said roll whereby said roll can be supported through said bores for rotation about the central axis of said roll; a pair of sleeve bearings, one of said sleeve bearings positioned in each of said bores, and each of said sleeve bearings defining a passage therein; and a pair of support shafts, one of said support shafts positioned in said passage of one of said bearings and projecting outwardly of the end of said roll and the other of said support shafts positioned in said passage of the other of said bearings and projecting

outwardly of the end of said roll opposite the first mentioned support shaft so that said bearings rotatably support one end of said roll on one of said support shafts and rotatably support the other end of said roll on the other of said support shafts whereby said bearings permit slight misalignment of said support shafts without significantly stressing said roll and said support shafts.

4,570,294

APPARATUS FOR SEPARATING THE GIZZARDS FROM THE ENTRAILS OF POULTRY AND FOR FURTHER PROCESSING THE GIZZARDS

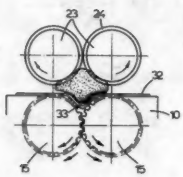
Pieter Meyn, Noordeinde 68C, 1511 AE Oostzaan, Netherlands

Filed May 31, 1983, Ser. No. 499,181

Claims priority, application Netherlands, Jun. 3, 1982, 8202240

Int. Cl.[4] A22C *17/14*

U.S. Cl. 17—11 **3 Claims**



1. An apparatus for separating the gizzards from the entrails of poultry and for further processing said gizzards, comprising

a horizontally extending feed section for the separate infeed of the gizzards along a substantially horizontal path of travel in a position in which the entrails attached thereto are hanging down from the gizzard, said feed section comprising at its rear end elongated means for detaching and removing the entrails hanging down from the gizzard,

a conveying section comprising slitting means for cutting open each gizzard, a guide member for said gizzards longitudinally extending between said detaching means and said slitting means, spreading means for spreading apart the opened gizzard, and cleaning means for removing the contents of the gizzard,

and a peeling section for removing the interior lining from the opened and spread gizzard,

said conveying section further comprising a driven elongate conveying member longitudinally extending above said guide member and said slitting, spreading and cleaning means respectively and adapted to engage the gizzard at its upper side to move the latter along said guide means from said detaching means to said slitting means and then past said spreading means and cleaning means to said peeling section, said conveying means having a forward end extending above said detaching means of said feed section and includes two parallel elongated shafts rotating in opposite directions with the axes of said shafts being positioned above said gizzard being moved on said guide member so that the lower sides of said shafts press down on the upper portion of said gizzard, said guide member including an elongated plate having a central portion forming a longitudinal extending trough-like channel, and said guide member being connected to said detaching means at the level of said gizzard path of travel through said feed section, whereby the gizzard is moved through the apparatus along a substantially continuous straight path.

4,570,295

APPARATUS FOR TRANSFERRING SLAUGHTERED POULTRY

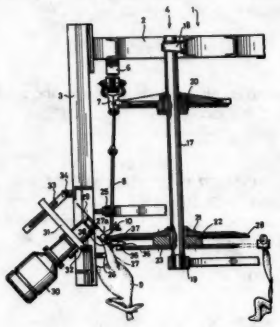
Martinus P. G. van Mil, Boxmeer, Netherlands, assignor to Stork PMT B.V., Boxmeer, Netherlands

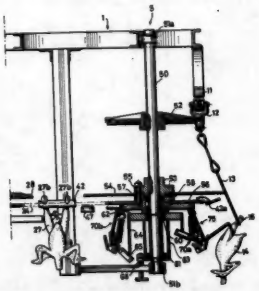
Filed May 16, 1983, Ser. No. 494,663

Claims priority, application Netherlands, May 28, 1982, 8202180

Int. Cl.[4] A22B *3/08, 5/00*; A22C *21/00*

U.S. Cl. 17—11 **8 Claims**





1. Apparatus for transferring slaughtered poultry from a first conveyor having first suspension shackles engaging the feet of the birds to a second conveyor having second suspension shackles engaging the hock joints of the birds via an endless transfer conveyor carrying outwardly projecting transfer shackles cooperating with said first conveyor and said second conveyor respectively and driven synchronously with the first conveyor comprising an entry station at the first conveyor for introducing the birds by their thighs into the transfer shackles, a means for cutting the hock joints of the birds, and an exit station at the second conveyor for transferring the birds from the transfer shackles to the second shackles, in which each of said outwardly projecting transfer shackles consists of a plate provided with two tapering take-up slots, the side of said plate opposite the entry openings of the slots being connected to the short arm of a hook-shaped carrier of which the long arm is connected pivotally about an axis parallel to the plane to the endless transfer belt and the exit station being provided with controllable ejectors acting upon the bird, the said ejectors being registered in turn with a transfer shackle and a second shackle, in which each transfer shackle cooperates with one of a number of guide yokes carried at the circumference of a guide wheel driven synchronously with the first conveyor and the endless belt in such a way that a guide yoke is situated above a transfer shackle when the latter receives the thighs of

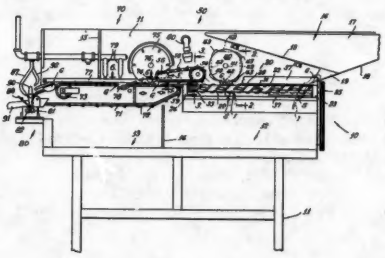
a bird, said yoke consisting of two first parts which converge in the direction of the first conveyor and slope upwardly to some extent and which merge into two downwardly extending second parts terminating in a point.

4,570,296

GIZZARD HARVESTING APPARATUS

William J. Hill, Rte. 3, Box 230, Ball Ground, Ga. 30107; Carl J. Hill, deceased, late of Ball Ground, Ga., and by Hazel R. Hill, executrix, Rte. 3, Box 229, Ball Ground, Ga. 30107

Division of Ser. No. 374,772, May 4, 1982, Pat. No. 4,524,491.
This application Jun. 3, 1985, Ser. No. 721,611
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—11 8 Claims



1. In a poultry gizzard processing apparatus the improvement comprising a station for processing a plurality of gizzards which have been slit and opened to expose the interior membrane of the gizzards and from which the stomachs and intestines have been removed so as to leave a minor portion of tender lining attached to each gizzard, said station comprising:

means for conveying said opened gizzards to said station in a predetermined position;

shearing means positioned at said station to receive said opened gizzards from said conveying means and adapted to shear said remaining minor portion of the tender lining from each gizzard; and

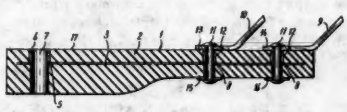
peeling means adapted to peel the interior membrane from each opened gizzard.

4,570,297

SCRAPER BLOCK FOR AN UNHAIRING MACHINE

Gerrit J. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G.J. Nijhuis B.V., Netherlands

Filed Nov. 30, 1984, Ser. No. 676,547
Claims priority, application Netherlands, Dec. 2, 1983, 8304151
Int. Cl.[4] A22B *5/08*
U.S. Cl. 17—16 4 Claims



1. Scraper block for a machine for unhairing slaughtered animals, particularly pigs, comprising: a relatively thick, substantially rectangular slab of elastic material, such as an elastic plastics material or rubber, which is provided at one end, near one shorter transverse edge, with fastening holes and, near the opposite end, at some distance from the end edge, is provided with holes for scraper means fastened on the working surface of the slab, the latter being reinforced by means of a leaf spring, the leaf spring being incorporated in the material of the slab and extending over practically the entire length and width of the slab, the leaf spring having holes which correspond with the holes for the fastening of the block in the machine and for fastening all the scraper means.

4,570,298

DUAL EXTRUSION APPARATUS

Kenneth E. Tribbett, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Filed Dec. 6, 1984, Ser. No. 679,027
Int. Cl.[4] A22C *11/02*
U.S. Cl. 17—41 6 Claims

1. In a frank making apparatus for producing a frank in which the apparatus includes a support structure, a metering pump connected to the source of flowable sausage material having an outlet through which the sausage material is discharged, a casing hopper and feed mechanism for sequentially feeding the casing into a position to be stuffed, a linking mechanism for forming the stuffed casing into links, comprising:

a second metering pump connected to a source of flowable core material, such as chili, cheese or the like, having an outlet through which the flowable core material is discharged,

a reciprocating stuffing horn assembly mounted on the support structure for reciprocating movement relative thereto between an advanced position and a retracted position, said stuffing horn assembly including an elongate cylindrical outer stuffing tube having an open forward end defining a discharge outlet, said outer stuffing tube having an inlet opening therein intermediate the ends thereof,

an elongate generally cylindrically shaped inner stuffing tube positioned concentrically within said outer stuffing tube and being spaced radially inwardly therefrom to define a cylindrical chamber between the inner and outer stuffing tubes, the front end of said inner stuffing tube being open and being disposed in the same transverse plane as the front end of the outer stuffing tube, the open front end of said inner tube defining a discharge outlet, the interior of said inner stuffing tube being of uniform circular cross sectional configuration, said inner stuffing tube having an inlet therein intermediate the ends thereof and spaced rearwardly of the inlet opening of said outer tube,

said outer tube including a coupling member adjacent the rear end portion thereof having an axial opening therethrough,

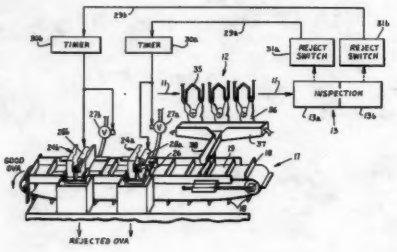
said inner tube including a coupling member at its rear end portion having a stem projecting rearwardly therefrom and projecting through the opening in the coupling member of said outer stuffing tube and being connected to the latter,

means for shifting said stuffing horn assembly between advanced and retracted positions, said stuffing horn assembly when in the advanced position having the front end thereof projecting into a casing and having the inlet of said inner stuffing tube disposed in communicating relation with the second metering pump and having the inlet of the outer stuffing tube disposed in communicating relation with the first metering pump, where the casing will be stuffed with an inner core of flowable core material, such as chili, cheese or the like, and an outer cylindrical layer of sausage material.

4,570,299
OVA COLLECTING APPARATUS AND METHOD

Freddie T. Ellis, 100 Hickory St., Metter, Ga. 30439

Filed Jun. 10, 1983, Ser. No. 503,091
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—45 **10 Claims**



1. The method of collecting ova from the carcasses of fowl serially moving along a first path, comprising the steps of:

removing and commingling the ova from at least two carcasses while at a first location on the first path, thereby losing the identity of the particular carcass from which each ovum is removed;

serially transferring the commingled ova to a progression of defined ova-receiving regions moving on a second path at a speed correlated to the continuing movement of carcasses along the first path, so that regions on said second path contain commingled ova from more than one carcass;

inspecting the carcasses at a subsequent location on the first path after said removal of ova, so as to identify rejectable carcasses;

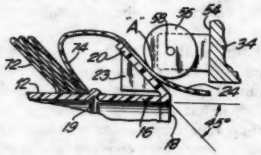
moving the ova locations and commingled ova therein along said second path so that an ova location with commingled ova, including ova from a particular carcass, arrives at a certain location on the second path in a predetermined relation with the arrival of that particular carcass at said subsequent location for inspection on the first path; and

in response to rejection of a carcass at said subsequent location, ejecting all the commingled ova arrived at said certain location on the second path so that the ova previously removed from the rejected carcass are ejected together with other commingled ova present at said certain location, whereby the ova from rejected carcasses are ejected without identifying the ova removed from each individual carcass.

4,570,300
CASING ARTICLE

Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 24, 1984, Ser. No. 583,317
Int. Cl.[4] A22L *11/10, 11/02*
U.S. Cl. 17—49 **21 Claims**



1. An elongated substantially straight cylindrical tubular core having fore and aft ends and a longitudinal bore forming a passage for foodstuff through the tubular core and into a food casing drawn forward over the core fore end from a casing supply disposed on the tubular core, said tubular core further comprising:

(a) a flange extending radially from and circumferentially about said fore end in a plane oriented transverse and generally perpendicular to the longitudinal axis of said tubular core, said flange being of a size to accommodate passage of casing over and about said flange during stuffing;

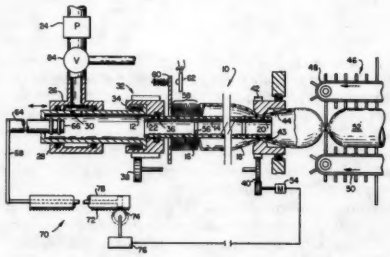
(b) a rotatably drivable part on said flange to rotate said tubular core about its longitudinal axis, said drivable part having at least one surface for bearing in pressable driving engagement against a driving element rotatable about said axis; and

(c) said surface having receivable thereagainst casing which is pressed against said surface by the driving element as the casing is drawn over and about said flange during stuffing and rotation.

4,570,301
STUFFING HORN CLEAN OUT

John H. Beckman, Downers Grove, and Joseph A. Nausedas, Oak Forest, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 29, 1984, Ser. No. 665,909
Int. Cl.[4] A22C *11/06*
U.S. Cl. 17—49 **19 Claims**



15. A stuffing method comprising:

a. passing a flowable foodstuff under pressure through an outlet and into and through a stuffing tube releaseably connected in communication with the outlet and hence into casing deshirred from a shirred casing supply carried on the stuffing tube;

b. continuing step (a) until there remains in the casing supply on the stuffing tube a terminal casing length sufficient to encase the volume of foodstuff contained in the stuffing tube; and

c. while maintaining said stuffing tube in communication with said outlet, expressing the volume of foodstuff from the stuffing tube and into the terminal casing length while preventing flowable foodstuff from passing under pressure through said outlet and into said stuffing tube.

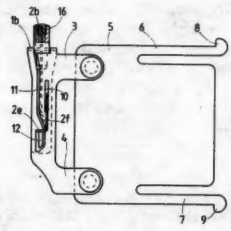
4,570,302
DEVICE FOR RETAINING AN ARTICLE ON AN ITEM OF CLOTHING

Bernard de Montalembert, 9, rue Saint-Louis, 77300 Fontainebleau, France

Filed Oct. 15, 1984, Ser. No. 660,955
Claims priority, application Switzerland, Oct. 17, 1983, 5637/83
Int. Cl.[4] A45C *13/18*
U.S. Cl. 24—3 H **9 Claims**

1. A device for retaining an article on an item of clothing, for example retaining a billfold in a pocket, the device being intended to be attached to the article to be retained, and compris-

ing a rigid U-shaped staple provided with means for attachment to the said article, on which staple are mounted, a resilient member the end of which is intended to penetrate into the item of clothing on which the said article is located, in case of relative movement tending to separate the said article from the said item of clothing, and, a control means mounted to slide on the staple between two positions, the said resilient member being aligned obliquely, from one wing of the staple to the other, towards the base of this staple to the other, towards the base of this staple, in a first position of the control means, and being moved away from the opposite wing in the second position of the control means, wherein the said control means and



the said resilient means are formed by a single piece comprising a resilient, bent and pointed metal wire, said resilient member and staple cooperating to urge said control means toward said first position, the part of the wire possessing the spike passing obliquely through one of the wings of the staple through a cut-out so as to reach, at least approximately, the opposite wing, in the first position of the control means, and to move away from the opposite wing, flexing and bearing on one end of the cut-out, in the second position of the control means, in a manner such that the spike moves away from the opposite wing, performing a combined translatory and rotatory movement.

4,570,303

RETAINING CLIP

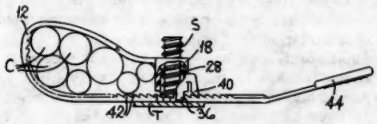
John F. Richmond, Hopton, England; Dieter Mauer, Lollar, and Heinz O. Baum, Giessen, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Jul. 13, 1984, Ser. No. 630,711

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325686

Int. Cl.⁴ B65D *63/06*; F16B *13/04*

U.S. Cl. 24—16 PB **3 Claims**



1. A retaining clip for secure engagement with a stud having a screw thread or annular ribs, comprising a mount of resilient material provided with inwardly directed transverse flanges for engagement with the thread or ribs of the stud when the clip is pushed down onto it, characterized in that said mount is oblong as viewed in cross-section at right angles to the axis of a stud on which it is assembled, said flanges extending from the long sides of the mount at opposite ends of its minor axis, said mount further including abutments extending inwardly therefrom at opposite ends of its major axis, said mount being deformable in response to pressure applied to the ends of its major axis such that said flanges are forced apart to thereby release them from the thread or ribs of the stud, and the abutments being effective to ensure the position of the mount in which said flanges are in engagement with the stud, and limit deformation of said mount.

4,570,304

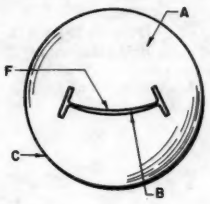
FASTENER FOR DISPOSABLE WASTE CONTAINER LINERS

Albert H. Montreuil, and Beverly A. Montreuil, both of 4365 A-2 Springcreek Dr., Dayton, Ohio 45405

Filed Jun. 7, 1983, Ser. No. 483,694

Int. Cl.⁴ B65D *77/10*

U.S. Cl. 24—30.5 S **1 Claim**



1. A retainer and closure for a garbage can liner bag consisting of a thin flexible disk having a continuous uninterrupted peripheral edge and a centrally located arcuate opening extending through the disk, said opening defined by two spaced apart complementary internal edges of the disk, each of said internal edges of substantially constant curvature with one internal edge convex, the other internal edge concave, and the arcuate opening having two ends terminating within the periphery of said disk, each end comprising a slot defined by a continuation of said internal edges extending substantially perpendicular to the arcuate opening, thereby defining a pair of confronting cooperating flaps in the disk, whereby the disk can be utilized in a configuration in which a portion of the garbage can liner bag is drawn through the arcuate opening in the disk for restricting the bag mouth and retaining a garbage can liner around the exterior of the open top of a garbage can in which the remainder of the bag is disposed, and another configuration in which the compressed mouth of a bag is extended through the arcuate opening in the disk to close the bag.

4,570,305

TENSIONING DEVICE FOR TENSIONING LINES, PARTICULARLY CHAINS OR BELTS

Reinhard Smetz, Baldingen, and H. H. Speich, Hüttlingen, both of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,163

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3344487

Int. Cl.⁴ B25B *25/00*

U.S. Cl. 24—68 CD **11 Claims**

1. A tensioning device for tensioning lines, particularly chains or belts, having a rotatable drive element serving to wind up the tensioning line, at least one ratchet wheel connected integrally in rotation thereto and exhibiting directionally oriented notches, and a drive part, serving to introduce the rotary movement into the drive element, on which a drive pawl cooperating with the ratchet wheel is mounted slidably

counter to the action of a spring and which is provided with at least one control cam to transfer a blocking mechanism associated with the ratchet wheel into an inoperative position, whilst the notches of the ratchet wheel are shaped so that they are firmly retained by the detent pawl during movement of the drive part in one direction, whereas during the movement of the pivot lever in the opposite direction they are entrained by the latter via the drive pawl, wherein the blocking mechanism exhibits a plurality of blocking elements (12, 13) which can be brought individually into engagement with the notches (11) of the ratchet wheel (6).

4,570,306

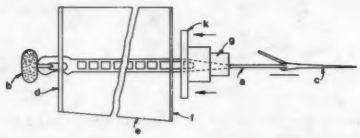
RELEASABLE UPHOLSTERY TIE

Ronald Eyler, 1544 Jefferson Blvd., Hagerstown, Md. 21740

Filed Jan. 28, 1985, Ser. No. 680,525

Int. Cl.[4] A44B *1/18*; A47C *31/02*

U.S. Cl. 24—90 B **1 Claim**



1. A releasable adjustable upholstery tying device assembly for fastening buttons to upholstered furniture, said device formed of a flexible nylon material, and consisting of two parts—a strap and a fastener head; said strap comprising a ladder-like structure with a hook on one end and a thread-like appendage on the other end, said hook end of the strap is attached to a button, and the thread-like end is threaded through an upholstery needle, which will then be inserted through the upholstery material and filling, said thread-like end is then threaded through the fastener head and snugged up to bring the button to the desired position, said fastener head further including a pawl and an aperture adjusting means as a second part of the releasable upholstery tying device, wherein the ratchet pawl engaging and holding said strap in the designated position and means to be inserted through said aperature for facilitating the release of said ratchet pawl.

4,570,307

BUTTON HAVING PLATE FOR DEFLECTING AN ATTACHING TACK

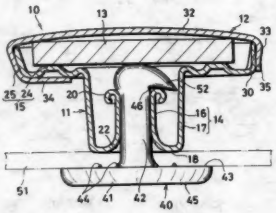
Yoshihiro Kanzaka, Toyama, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 601,789

Claims priority, application Japan, Apr. 26, 1983, 58-62541[U]

Int. Cl.[4] A44B *1/42*

U.S. Cl. 24—95 **6 Claims**



1. A button for attachment to a garment fabric, comprising:

(a) a button body including a tubular stem and an annular flange extending radially outwardly from an end of said tubular stem, said annular flange including a flange bottom and a first marginal wall flaring radially outwardly from said flange bottom and having a plurality of radially outwardly extending projections;

(b) a cap mounted on said button body and having a second marginal wall deformed over said first marginal wall and including a plurality of protuberances extending radially outwardly due to deformation of said second wall by said projections, respectively, and held in interlocking engagement therewith against relative rotation;

(c) a back plate disposed between said button body and said cap and having a portion placed on said flange bottom; and

(d) a tack member having a circular head and a shank extending centrally from said circular head and including a tapered end portion for being pierced through the garment fabric and inserted into said tubular stem, said tapered end portion being plastically bendable against said back plate laterally into a hook held in locking engagement with said tubular stem when said tapered end portion is forced into said button body.

4,570,308

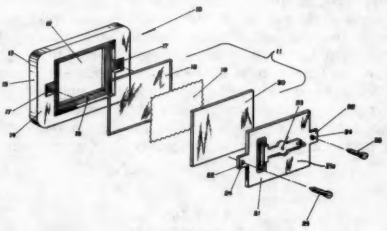
CONSTRUCTION FOR A BELT BUCKLE

Robert G. Weisgerber, R.D. #6, Box 2732, Mt. Pleasant, Pa. 15666

Filed Mar. 16, 1984, Ser. No. 590,265

Int. Cl.[4] A44B *11/00*

U.S. Cl. 24—163 K **4 Claims**



1. A belt buckle for selectively displaying an article for viewing, which article is in a relatively flat form, and including a buckle assembly for connecting together the ends of a belt, comprising:

a frame having a thickness with front and rear surfaces and an opening extending through said thickness from said rear to said front surfaces, said front surface being constructed such that said opening forms a viewing window, and said rear surface being constructed such that said opening forms a cavity, which cavity is greater in size than said window for receiving said display article which is placed into said cavity in said rear surface to substantially cover said window and be retained in said cavity for its viewing,

said rear surface of said frame further constructed such that said opening has laterally opposed recessed slots, each slot communicating with and smaller than said cavity,

a relatively flat back plate consisting of a main body with laterally opposed arranged protrusions, each protrusion corresponding to said recessed slots,

said main body of said back plate constructed to be received in said cavity to completely cover the back of said article, and said protrusions each constructed to be received in a said different recessed slot in a manner said back plate fits flushly in said opening relative to said rear surface, and

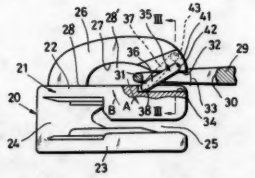
fastening means insertable in said protrusions of said back plate and into said frame for securing said back plate and article in said opening in said frame.

4,570,309

SLIDE FASTENER SLIDER WITH DETACHABLE PULL TAB

Susumu Ishii, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,973
Claims priority, application Japan, Mar. 25, 1982, 57-47603
Int. Cl.[4] A44B *19/26*
U.S. Cl. 24—429 8 Claims



1. A slide fastener slider comprising:

(a) a body including a pair of spaced wings;

(b) a support lug mounted on one of said wings with a space defined between said support lug and said one of the wings, said support lug having an end spaced from said one of the wings by a gap communicating with said space, and having a pair of recesses opening away from each other out of mutual registry;

(c) a pull tab having a pintle normally disposed in said space, said gap being wide enough to allow said pintle to pass therethrough; and

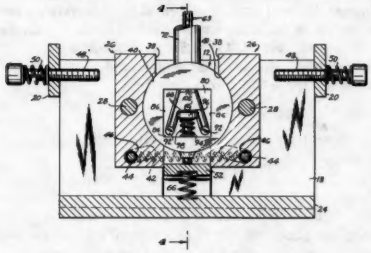
(d) a resilient pull tab retainer movable between a first position in which said retainer normally closes said gap under its own resiliency and a second position in which said retainer is displaced out of said gap against its own resiliency, said resilient pull tab retainer comprising a pair of spaced legs extending out of alignment with each other and having a pair of bent ends, respectively, and, a joint interconnecting said spaced legs remotely from said bent ends, said bent ends being fitted respectively in said recesses, said legs being normally urged resiliently to extend across and close off said gap in said first position.

4,570,310

COUPLING SYSTEM WITH CABLE

Jerome D. Gelula, 535 E. 86th St., New York, N.Y. 10028

Filed Aug. 13, 1984, Ser. No. 639,981
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—645 13 Claims



1. An improved latching system, comprising, in combination;

a supporting structure,

at least one capture member supported for movement between capturing and releasing positions by said supporting structure,

first spring means carried by said supporting structure normally biasing said capture members towards said releasing position,

a locking member for said capture member supported for movement between interfering and non-interfering positions by said supporting structure, wherein in said interfering position said capture member is in said capturing position and in said non-interfering position said capture member is in said releasing position,

second spring means carried by said supporting structure normally biasing said locking member toward said interfering position,

connector means adapted to be releasably captured by said capture member in said capturing position, said connector means forming an internal cavity,

cable means having portions thereof disposed within said cavity for influencing said locking member from a position remote from said locking member,

anchor pin means disposed within said cavity for guiding portions of said cable means,

actuating means disposed within said cavity and extending from said connector member and movable from a non-release position to a release position in response to movement of said cable means, said locking member being movable to said non-interfering position in response to movement of said actuating means to said release position,

third spring means carried by said connector means normally biasing said actuating means towards said non-release position, and

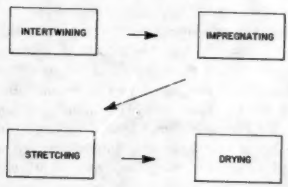
gripping means carried by said connector means and disposed within said cavity means for holding said cable means against the top portion of said actuating member.

4,570,311

METHOD FOR MANUFACTURING WATER SOLUBLE FABRIC FOR CHEMICAL LACES

Miichiro Kawamura, and Mitsuru Fujihashi, both of Shiga, Japan, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Dec. 2, 1982, Ser. No. 446,335
Claims priority, application Japan, Dec. 7, 1981, 56-197461
Int. Cl.[4] D04C *1/02;* D06M *1/00*
U.S. Cl. 28—164 7 Claims



1. A method for manufacturing water soluble fabrics useful in the manufacture of chemical lace comprising:

a. intertwining webs comprised of a hot water soluble polyvinyl alcohol fiber by subjecting said webs to the action of fluid stream of provide a fibrous sheet at least a portion of which has highly intertwined fibers and increased fiber density,

b. impregnating said fibrous sheet with a water soluble resin,

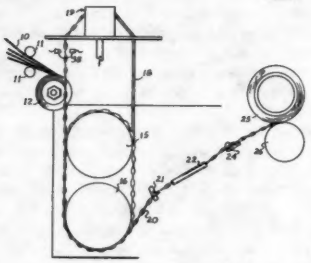
c. stretching said sheet by at least about 20% in the direction of width of the sheet, and

d. drying said sheet by the application of heat sufficient to adhere the resin to the fibers of the sheet.

4,570,312
METHOD AND APPARATUS FOR PRODUCING ENTANGLED YARN

Charles G. Whitener, Jr., P.O. Box 27578, Atlanta, Ga. 30327

Filed Nov. 29, 1983, Ser. No. 556,145
Int. Cl.[4] D02G 1/16; D02J 1/08
U.S. Cl. 28—271 5 Claims



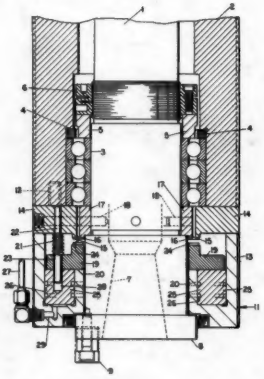
1. In a yarn entangling apparatus including an air entangling head for producing an entangled yarn having spaced tacks and bulky portions a yarn supply for supplying a plurality of yarn ends for forming a sliver, a sliver input for said air entangling head, an entangled yarn output from said air entangling head, an air supply for supplying air under pressure to said air entangling head, feed means for said sliver, and entangled yarn and take-up means for said entangled yarn, the combination therewith of a pair of rolls adjacent to said air entangling head, said pair of rolls having substantially uniform diameters along the axes thereof, plurality of loops of said sliver passing around both rolls of said pair of rotating rolls before feeding said sliver to said air entangling head a second plurality of loops of said entangled yarn passing around both rolls of said pair of rotating rolls before delivery of said entangled yarn to said take-up means said pair of rotating rolls being rotated at a greater surface speed than the feed rate of said sliver and delivery rate of said entangled yarn so that said pair of rolls slip with respect to said plurality of loops therearound whereby the feed and delivery rates are self-adjusting and uniformity of the entangled yarn is improved.

4. In a method for producing air entangled yarns having spaced tacks and bulky portions wherein a plurality of yarn ends is gathered as a sliver, said sliver is fed to an air entangling head, and an entangled yarn is removed therefrom and said entangled yarn is subsequently wound into a package, the improvement comprising the steps of passing said sliver a first plurality of turns around both rolls of a pair of constantly rotating rolls before feeding said sliver to said air entangling head, passing said entangled yarn a second plurality of turns around both rolls of said pair of constantly rotating rolls before winding said entangled yarn into a package, the diameter of said rolls being substantially uniform along their axes so that said first plurality of turns and said second plurality of turns are of substantially the same diameter, said second plurality of turns being equal in number to said first plurality of turns and spaced along the axes of said rolls from said first plurality of turns, said constantly rotating rolls rotating at a surface speed greater than the feed rate of said sliver and greater than the delivery rate of said entangled yarn, the arrangement being such that an increase in tension on the sliver will cause less slip between said sliver and said pair of rolls and hence faster feeding of the sliver towards the air entangling head, and an increase in tension on the entangled yarn will cause less slip between said entangled yarn and said pair of rolls and hence faster removal of the entangled yarn from the air entangling head whereby the feed and delivery rates are sefl-adjusting and uniformity of the entangled yarn is improved.

4,570,313
SPINDLE LOCK-UP DEVICE

Paul E. Holmstrom, and Joseph F. Ogrinc, both of Cincinnati, Ohio, assignors to G. A. Gray Division, The Warner & Swasey Company, Cincinnati, Ohio

Filed Dec. 31, 1984, Ser. No. 687,850
Int. Cl.[4] B23C 5/26
U.S. Cl. 29—26 A 12 Claims



1. A lock-up device for detachably connecting a rotatable spindle having a tool holder at its free end to a surrounding non-rotatable support so that the spindle may serve as a fixed tool support, said device comprising a first gear member fixedly secured to said non-rotatable support, a second gear member fixedly secured to said spindle for rotation therewith, a third gear member movable axially relative to said spindle from a retracted to an extended position, said first and second gear members each having teeth facing said third gear members, said third gear member having teeth facing said first and second gear members positioned to engage the teeth of said first and second gear members when said third gear member is moved axially from its retracted to its extended position, means normally maintaining said third gear member in its retracted position, and actuating means for moving said third gear member to its extended position, whereby said spindle is locked against rotation relative to said non-rotatable support by the concurrent engagement of the teeth of said third gear member with the teeth of said first and second gear members.

4,570,314
PRESS ROLL

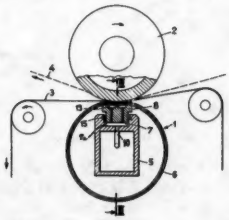
Herbert Holik, Ravensburg; Helmut Hund, Vorberg, and Peter Mirsberger, Weingarten, all of Fed. Rep. of Germany, assignors to Escher Wyss Aktiengesellschaft, Zürich, Switzerland

Filed Jun. 4, 1982, Ser. No. 385,252
Claims priority, application Switzerland, Jun. 24, 1981, 4172/81; Jun. 30, 1981, 4285/81
Int. Cl.[4] B21B 31/32
U.S. Cl. 29—113 R 17 Claims

1. A press roll for forming an extended nip comprising:
a stationary roll support;
a roll shell counted to be rotatable about said stationary roll support;
said roll shell being formed of an easily deformable material;
a support surface at which there is supported the roll shell at the roll support at the region of a pressing location;
said roll shell having an inner surface of substantially circular cylindrical shape;
said roll shell moving at its inner surface along said support surface;
said support surface possessing at least at a portion of its

extent in the circumferential direction of the roll shell a shape which deviates from said substantially circular cylindrical shape of the inner surface of the roll shell in a manner which causes a central portion of the roll shell to deviate from said substantially circular cylindrical shape and adapts the deviated cylindrical shape of said central portion of said roll shell to a counter surface intended to coact with the press roll;

substantially circular cover members rotatably and sealingly journaled upon said stationary roll support;



said roll shell having substantially cylindrical end regions which merge with said central portion of said roll shell which deviates from said substantially cylindrical shape and with said substantially cylindrical end regions being fastened to said cover members; and

sealing means interposed between said cover members and said stationary roll support for sealing an internal space of said roll shell.

4,570,315

METHOD OF MAKING A BEARING

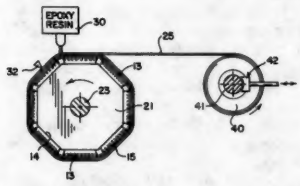
James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 7, 1983, Ser. No. 472,532

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.[4] B21D *53/10*

U.S. Cl. 29—149.5 S **7 Claims**



1. A method of fabricating a bearing assembly comprising the steps of building a flat rectangular sheet of fiberglass reinforced ply with an elastomer therethrough; vulcanizing said fiberglass reinforced elastomer into a flat sheet; cutting said vulcanized sheet of fiberglass reinforced elastomer into a plurality of strips; abutting a plurality of said fiberglass reinforced elastomer strips onto a polygonal shaped mandrel to form a circumferential hoop with a clearance space between the respective strips; retaining said strips on said mandrel with said clearance space between strips while simultaneously rotating said mandrel and (while) wrapping a fiber fabric onto the outer circumference of said circumferentially spaced strips; (and) impregnating the fiber fabric with a plastic resin while wrapping said fabric; and curing said resin to complete a fiber reinforced plastic outer shell on said circumferentially spaced strips to make a bearing assembly.

4,570,316

METHOD FOR MANUFACTURING A ROTOR FOR A ROTARY FLUID PUMP

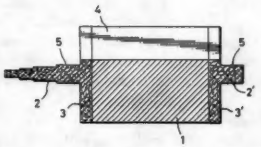
Hiroshi Sakamaki, Tochigi; Susumu Sugishita, and Yukio Horikoshi, both of Saitama, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Japan

Division of Ser. No. 610,664, May 16, 1984. This application Jan. 16, 1985, Ser. No. 691,866

Claims priority, application Japan, May 20, 1983, 58-88928

Int. Cl.[4] B23P *15/00*; B22D *19/14*; F01C *21/00*; F04C *15/00*

U.S. Cl. 29—156.8 R **6 Claims**



1. A method of making a rotor for a rotary compressor having a central portion and two opposite end portions, said end portions including shaft means, said method comprising the steps of:

(a) pressing a plurality of inorganic fibers into the form of each of the end portions of said rotor such that said pressed end portions are porous;

(b) arranging said end portions in an opposing relationship in a mold disposed to form said central portion between said end portions;

(c) placing molten metal into said mold under conditions whereby said molten metal infiltrates said porous end portions while also forming said central portion; and

(d) forming fiber-reinforced metal matrix composite end portions integral with said central portion comprised of said metal by solidifying said metal in said mold and within said porous end portions.

4,570,317

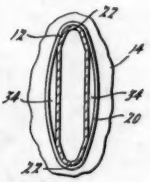
METHOD OF ATTACHING A TUBE TO A FIN

Thomas R. Veling, Dearborn; George C. Wiklund, Canton, and Kwang H. Park, Grosse Ile, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 18, 1985, Ser. No. 692,459

Int. Cl.[4] B21D *53/08*

U.S. Cl. 29—157.3 A **8 Claims**



1. A method of attaching a fluid conducting metal tube to a heat dissipating metal fin, which comprises the steps of:

forming a metal tube having a generally elliptical cross-section, said elliptical cross-section having first similarly curved surfaces at opposite ends of a major axis thereof and second similarly curved surfaces at opposite ends of a minor axis thereof;

forming a heat dissipating metal fin;

forming an ellipitcally shaped collar on said fin, said collar providing an opening through said fin and being at least about 1¼ times the thickness of said metal forming said fin,

said opening provided by said collar of said fin being of a size slightly larger than said elliptical cross-section of said tube;

fitting said tube inside said opening of said collar of said fin so that areas of said tube and said collar are juxtaposed;

expanding said tube along said major axis so as to bring said first similarly curved surfaces at opposite ends thereof into contact with portions of said collar in juxtaposition therewith;

continuing expansion along said major axis and initiating expansion of said tube from opposite ends of said major axis toward said surfaces which were defined at opposite ends of said minor axis of said tube so that any juxtaposed area of said tube and said collar are subjected to an expansion process in which said tube is moved towards said collar, said two elements are brought into contact with one another, and then said two elements are expanded together;

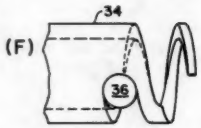
progressively terminating said tube and collar expansion process from said major axis of said tube toward said minor axis thereof as juxtaposed areas of said tube and said collar reach a condition in which said tube is being deformed plastically but said collar is still being deformed elastically.

4,570,318

OVERUNNING CLUTCH SPRING

Jules G. Kish, West Haven, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 12, 1984, Ser. No. 660,335
Int. Cl.[4] B23P *13/00*
U.S. Cl. 29—173 **2 Claims**



1. A method for producing an overrunning clutch spring from tube stock so that in a final, compressed state the spring ends are square, comprising:

axially notching the tube stock with a cutter having a diameter (D);

cutting the first coil on a lead equal to the diameter (D) so that it varies in thickness from W/2 at its end (44) to 3W/2, where (W) is the desired thickness of the first coil; and

cutting subsequent coils on a lead equal to the diameter (D) plus the desired coil thickness.

4,570,319

UNIVERSAL JOINT DISMANTLER

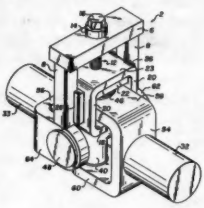
Mike Skoworodko, 2250 Cascade St., Abbotsford, British Columbia, Canada (V2T 3G3)

Filed Sep. 4, 1984, Ser. No. 646,456
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—259 **6 Claims**

1. A device for dismantling a universal joint that comprises

a bridge member having a central hole formed in it and parallel spaced arms extending from one side;

a U-shaped grasping member having a threaded hole formed in its top and opposing fingers formed in its lower edge and a tightening bolt slidably received in the bridge member and threaded in the grasping member, the grasping member being received between the arms of the bridge member whereby tightening of the bolt moves the bridge



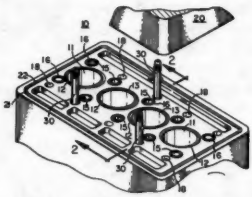
member downwardly with respect to the grasping member.

4,570,320

TOOL FOR ALIGNING ENGINE CYLINDER HEADS

Walter F. Kile, Box 77, Zion Hill, Pa. 18981

Filed Jan. 14, 1985, Ser. No. 691,161
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—271 **6 Claims**



1. A tool for alignment and assembly of cylinder heads to engine blocks wherein the block is provided with a plurality of holes and the head is provided with a plurality of holes, the tool to be inserted in said holes and which comprises

a central body,

a longitudinal threaded bore in said central body,

an inclined passageway in said body intersecting said bore,

at least two balls carried in said passageway,

a shoulder in said passageway retaining said balls therein but permitting partial exit of one ball outside of said body, wherein the ball is adapted to support said head above said block prior to its engagement with said block,

nose piece means in threaded engagement in said central body, rotation of which in one direction permits said balls to move into said passageway and rotation in the other direction forces a portion of one ball to be partially outside said body,

an extension connected to said central body and engaged in said holes in said block, and

handle means for engagement of said nose piece and rotation thereof for ball movement and tool withdrawal.

4,570,321

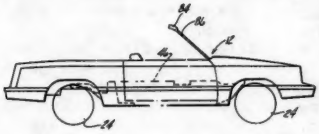
CONVERSION OF VEHICLE BODIES

David L. Draper, Hamburg, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Division of Ser. No. 512,522, Jul. 11, 1983, Pat. No. 4,514,891, which is a division of Ser. No. 282,078, Jul. 10, 1981, Pat. No. 4,457,555. This application Oct. 29, 1984, Ser. No. 665,713
Int. Cl.[4] B22D *19/10;* **B23P** *6/00*
U.S. Cl. 29—401.1 **2 Claims**

1. The method of conversion of a hard top passenger automobile body with a continuous metal roof panel into a vehicle body of the convertible type, the steps comprising: adding a reinforcing structure centrally and longitudinally within the

interior of the body member in which the reinforcing structure has an inverted U-shaped channel extending from the forward wall of the passenger compartment to a rearward wall of the passanger compartment, said inverted channel having a vertical size within said passenger compartment no greater than the seat level of seats disposed at opposite sides of said channel



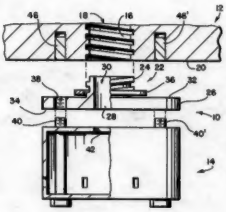
member, removing the glass in the windshield sides and rear of said body, cutting the upper body above a belt-line generally at the lower edge of the vehicle glass at either side of the body and rearwardly of the windshield, and adding a foldable top for folded storage rearwardly of the forward seats in said passenger compartment.

4,570,322

ADAPTER FOR MOUNTING AN EXHAUST MUFFLER TO AN INTERNAL COMBUSTION ENGINE AND METHOD FOR INSTALLING SAME

William R. Dence, 10534-52nd Ave. N., St. Petersburg, Fla. 33708

Filed Dec. 16, 1983, Ser. No. 562,172
Int. Cl.[4] B23P *7/00*; F01N *7/18*; F16L *5/00*
U.S. Cl. 29—402.17 **20 Claims**



1. An adapter for mounting an exhaust muffler onto a threaded exhaust port located at the external surface of an internal combustion engine, comprising:

a hollow, cylindrical neck portion having screw threads formed on a first end thereof and circumferentially about the outer surface thereof, for threadably engaging said threaded exhaust port of said internal combustion engine;

a plate portion formed on a second end of said neck portion, having a central opening coincident with said hollow interior of said neck portion, with a first face proximate to said screw threads and a second face opposite to said first face;

an annular gasket mounted on said neck portion, forming a seal between said external surface of said internal combustion engine and said first surface of said plate portion when said neck portion is operatively engaged with said exhaust port;

said plate portion including at least two threaded holes opening onto said second face, each hole for threadably engaging a corresponding threaded mounting bolt of an exhaust muffler which is to be mounted onto said second face of said plate so that an inlet port of said muffler is coincident with said central opening in said plate;

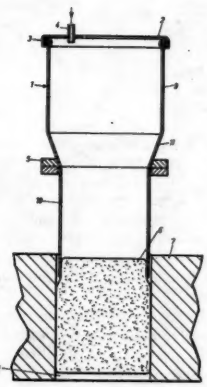
whereby exhaust gases exiting from said exhaust port of said internal combustion engine can be conducted through said neck portion and said plate portion of the adapter, into said exhaust muffler.

4,570,323

METHOD AND TOOL FOR INSERTING AN OVERDIMENSIONED ELASTIC BODY IN A CAVITY

Bengt E. Legerius, Hagvägen, and Hans W. Siebert, Skrakvägen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00133, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982, PCT Pub. No. WO82/03951, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 23, 1982, Ser. No. 456,016
Int. Cl.[4] B23P *11/02, 19/02*
U.S. Cl. 29—451 **8 Claims**



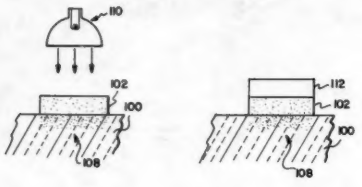
1. A method of sealingly inserting an elastic body in a cavity in a wall, said cavity having a smaller size than the body, said method comprising inserting a first tubular end portion of a tool into the cavity, placing the elastic body loosely in a second larger tubular end portion of the tool such that the elastic body rests on a tapered portion which joins the tubular end portions, closing the second tubular end portion, supplying pressure fluid to said second tubular end portion to radially compress axially push said elastic body to cause said body to pass from said second tubular portion into said first tubular portion and then to exit from said first tubular portion into said cavity, and allowing said elastic body to expand as it exits from said first tubular portion to tightly engage the wall around said cavity while removing said first tubular portion from said cavity.

6. Apparatus for sealingly inserting an elastic body in a cavity in a wall, said cavity having a smaller size then the body, said apparatus comprising a tool including first and second tubular portions, one of said tubular portions having a larger diametral extent than the other, and a tapered portion joining said first and second portions, said tubular portions having respective open ends, the open end of said one tubular portion being of a size to loosely receive the elastic body to be inserted into the cavity in the wall, said other tubular portion being of a size to be loosely inserted into the cavity in which the elastic body is to be inserted and extend along a major portion of the length of the cavity, means for sealing the open end of said one tubular portion, and means for introducing pressure fluid into said one tubular portion to apply pressure to said elastic body and compress the body and cause said body to pass from said one tubular portion to said other tubular portion and then to exit from said open end of said other tubular portion into said cavity whereat said body expands to tightly engage the wall around said cavity.

4,570,324
STABLE OHMIC CONTACTS FOR GALLIUM ARSENIDE SEMICONDUCTORS

Steven R. Smith, Dayton, and James S. Solomon, Springfield, both of Ohio, assignors to The University of Dayton, Dayton, Ohio

Filed Oct. 17, 1984, Ser. No. 661,981
Int. Cl.[4] H01L *21/265, 7/54, 7/36*
U.S. Cl. 29—576 B **10 Claims**



1. A method of making an ohmic contact to a gallium arsenide semiconductor comprising the following steps:

applying a layer of nickel to a selected contact area of a surface of said semiconductor;

irradiating at least a portion of said nickel layer with ions of an electrically active material whereby atoms of nickel and atoms of said electrically active material are driven into said semiconductor to form an ohmic contact to said semiconductor;

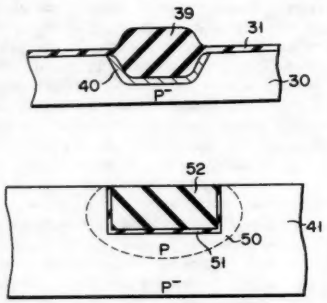
transient annealing said semiconductor; and

applying a layer of gold to at least a portion of the irradiated portion of said nickel layer to facilitate connection of an electrical conductor thereto whereby said nickel layer forms a boundary between said gold layer and said semiconductor to prevent the diffusion of said gold to the surface of said semiconductor and the resultant formation of a rectifying barrier which would destroy the ohmic nature of said contact.

4,570,325
MANUFACTURING A FIELD OXIDE REGION FOR A SEMICONDUCTOR DEVICE

Takayoshi Higuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 12, 1984, Ser. No. 680,909
Claims priority, application Japan, Dec. 16, 1983, 58-237357; May 10, 1984, 59-93184
Int. Cl.[4] H01L *21/76, 21/425*
U.S. Cl. 29—576 W **11 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

(a) sequentially forming an oxidation-resistive film and an oxidizable film on a semiconductor substrate;

(b) forming a window in a predetermined region of said oxidizable film, in which said oxidation-resistive film is exposed;

(c) performing thermal oxidation to said oxidizable film so as to convert said oxidizable film into an insulating film and for narrowing a width of said window by volume expansion due to conversion;

(d) forming a field oxide film in a region of said semiconductor substrate defined by said window of said insulating film; and

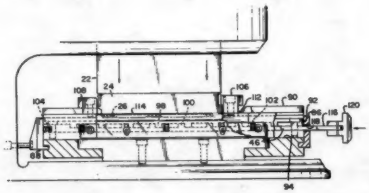
(e) forming a semiconductor element in the region of said semiconductor substrate isolated by said field oxide film.

6. A method according to claim 1, wherein said step (d) of forming said field oxide film comprises the steps of forming a groove in said semiconductor substrate by selectively removing said oxidation-resistive film and said semiconductor substrate using said insulating film as a mask, removing said insulating film and said oxidation-resistive film, and burying the groove with an oxide film.

4,570,326
CABLE HARNESS ASSEMBLY APPARATUS

David L. Meyer, and Brian A. Wolfe, both of Jonestown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1983, Ser. No. 555,327
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—566.3 **13 Claims**



1. A cable harness assembly apparatus comprising:

a press defining a workstation and having a vertically actuated termination ram at said workstation; and

an index frame moveable transversely through said workstation and carrying a plurality of connector receiving fixtures adjustably spaced therealong, at least one of said connector carrying fixtures having selectively actuable cable cutting means which, when actuated, severs the cable by descent of the ram during termination of the cable.

4,570,327
DIE HOLDER MECHANISM FOR A STAMPING MACHINE OR THE LIKE

Hans Klingel, Moeglingen, Fed. Rep. of Germany, and Alfred Matheis, Winsted, Conn., assignors to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

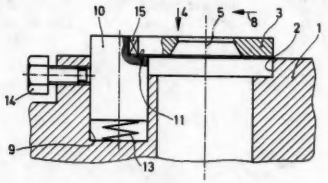
Filed Jun. 7, 1984, Ser. No. 618,207
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320825
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 29—568 **5 Claims**

1. In the operation of a machine tool, the steps comprising:

a. providing a machine tool including a frame, a tool holder on said frame having a recess in its upper surface, and a guide member movably supported in said tool holder at one point about the periphery of said recess and movable between a first elevated position extending above the upper surface of said holder and a second depressed position in which it does not extend above said upper surface;

b. causing said guide member to move into its first, elevated position;

c. moving a generally flat, substantially disc-shaped tool against said guide member, one of said guide member and tool having a recess about its periphery receiving a peripheral portion on the other of said tool and guide member to



position said tool member in a predetermined position and in a horizontal attitude above said recess in said tool holder; and

d. depressing said tool and guide member relative to said tool holder to seat said tool in said tool holder recess and to cause said guide member to move into its second, depressed position.

4,570,328

METHOD OF PRODUCING TITANIUM NITRIDE MOS DEVICE GATE ELECTRODE

J. B. Price; Philip J. Tobin, both of Scottsdale; Fabio Pintchovski, Mesa, all of Ariz., and Christian A. Seelbach, San Jose, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

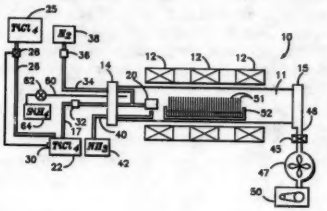
Filed Mar. 7, 1983, Ser. No. 472,517

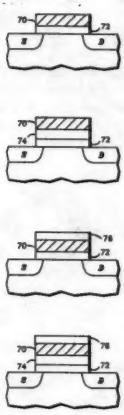
Int. Cl.⁴ H01L *21/285, 21/322*

U.S. Cl. 29—571 **9 Claims**

1. A method of making a metal oxide semiconductor device gate electrode and interconnect comprising the steps of:

chemical vapor depositing at a reduced pressure below approximately 300 millitorr a layer of titanium nitride over a selected gate dielectric and interconnect area; and





forming a layer of silicon in overlying relationship to said layer of titanium nitride.

4,570,329

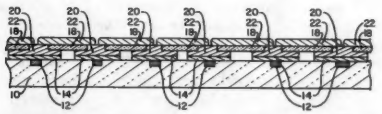
APPARATUS AND METHOD FOR FABRICATING BACKSIDE MOSAIC OF PHOTOCONDUCTIVE INFRARED DETECTORS

Christopher G. Paine, Worcester; William J. White, Chelmsford, both of Mass., and Susan J. Resnick, Great Neck, N.Y., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 15, 1984, Ser. No. 641,075

Int. Cl.⁴ H01L *21/98, 31/18*

U.S. Cl. 29—572 **16 Claims**



1. A method for fabricating a backside contacted photoconductive detector assembly from a first substrate wherein said detector assembly is electrically connected to exterior signal processing electronics by a second substrate having electrical contact pads, said method comprising the steps of:

A. forming one or more of said first contact pads on said second substrate, wherein each of said first contact pads is positioned in a desired area of electrical connection to said second substrate, and wherein said first contact pads are

positioned to avoid electrical contact between each of said first contact pads;

B. forming one or more insulating passivations on a first surface of said first substrate, said passivations shaped to expose portions of said first surface of said first substrate;

C. forming one or more first deformable contact pads on said first substrate wherein each of said first deformable contact pads is positioned between said passivations on said first surface and over said passivations threby forming a substantially planar exposed surface, wherein each of said first deformable contact pads is positioned such that it forms an electrical contact with said first substrate at said first surface, and wherein each of said first deformable contact pads provides electrical contact with said first contact pads on said second substrate;

D. bringing said first and said second substrates into physical contact such that said first contact pads are in contact with said first deformable contact pads and wherein said first contact pads are physically connected to and electrically connected to said first deformable contact pads on said first substrate; and

E. delineating at least two individual detector elements from said first substrate, wherein each of said elements covers each of said passivations, and such that said detector elements are in electrical contact with said first contact pads by means of said first deformable contact pads.

4,570,330

METHOD OF PRODUCING ISOLATED REGIONS FOR AN INTEGRATED CIRCUIT SUBSTRATE

Adrian I. Cogan, Waltham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 28, 1984, Ser. No. 625,390
Int. Cl.⁴ H01L *21/76, 21/95*
U.S. Cl. 29—576 W **4 Claims**

1. The method of producing a substrate for the fabrication of semiconductor integrated circuit devices therein comprising

providing a body of semiconductor material of one conductivity type of relatively high resistivity having opposite first and second surfaces;

forming grooves in said body at said first surface thereof to provide a plurality of isolated areas of said first surface, each area being encircled by grooves;

forming a first coating of an adherent nonconductive protective material overlying said first surface and filling said grooves;

removing protective material of said first coating to expose particular regions of said first surface, each region encompassing only one of said plurality of isolated areas of said first surface;

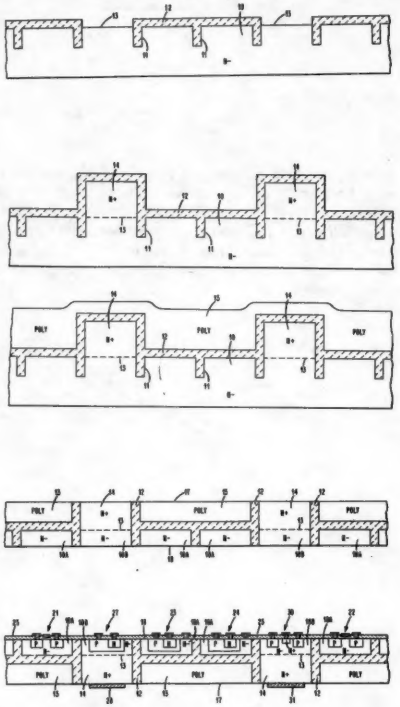
growing an epitaxial layer of semiconductor material of said one conductivity type of relatively low resistivity on each of said regions of said first surface, each of said epitaxial layers having side surfaces encircling the layer and disposed transversely of said first surface;

forming a second coating of said adherent nonconductive protective material on the exposed surfaces of said epitaxial layers to provide with the remainder of said first coating a continuous coating of said adherent nonconductive protective material;

depositing a layer of semiconductor material on said coating of adherent nonconductive protective material, the deposited layer of semiconductor material being adherent to the remainder of the first coating of protective material and being adherent to the portions of the second coating of protective material which are adherent to the side surfaces of the epitaxial layers; and

removing material to provide a first planar surface including surfaces of said deposited layer of semiconductor material and surfaces of said epitaxial layers of semiconductor material encircled by surfaces of protective material, and to provide a second planar surface substantially parallel to said first planar surface including a plurality of surface areas of semiconductor material of the one conductivity type of relatively high resistivity encircled by surfaces of protective material in said grooves;

whereby the resulting substrate includes first and second sections of semiconductor material; each section being electrically isolated from the other sections by intervening nonconductive protective material; each of said first sections being of semiconductor material of the one conductivity type of relatively high resistivity having a surface area in said second planar surface and extending to a portion of said first coating of nonconductive material lying between semiconductor material of the one conductivity type of relatively high resistivity and semiconductor material of the deposited layer; each of said second sections including a first zone of semiconductor material of the one conductivity type of relatively high resistivity having a surface area in said second planar surface and a second zone of semiconductor material of the one conductivity type of relatively low resistivity contiguous to the first zone and having a surface area in said first planar surface.



4,570,331

THICK OXIDE FIELD-SHIELD CMOS PROCESS

S. Sheffield Eaton, Jr., and Cheng-Cheng Hu, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

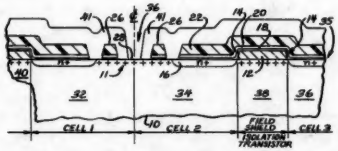
Filed Jan. 26, 1984, Ser. No. 574,056
Int. Cl.⁴ H01L *21/94, 21/265*
U.S. Cl. 29—576 B **26 Claims**

1. In the fabrication of a semiconductor memory structure having a large number of memory cells each having a respective cell capacitance, the improvement in providing isolation between adjacent cells comprising the steps of:

developing a relatively thick oxide layer upon a silicon substrate; then

etching holes through said oxide for charge storage regions whereby the space between memory cells is determined by an etching process; then

introducing impurities into the substrate via said etched holes to form memory cell capacitor regions in the substrate;



forming a layer of an enhanced dielectric material over said capacitor regions and said relatively thick oxide without substantially increasing the thickness of said relatively thick oxide; and

adding a capacitor plate over said enhanced dielectric layer and over said relatively thick oxide.

4,570,332

METHOD OF FORMING CONTACT TO THIN FILM SEMICONDUCTOR DEVICE

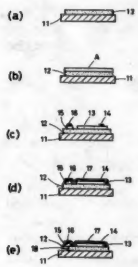
Yutaka Yamauchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 9, 1983, Ser. No. 492,675

Claims priority, application Japan, May 10, 1982, 57-78851; May 10, 1982, 57-78852

Int. Cl.⁴ H01L *21/28, 21/326, 31/18*

U.S. Cl. 29—586 **23 Claims**



1. A method for making an electrode on a desired region of a thin film semiconductor layer having a junction therein and deposited on a conductive surface, comprising the steps of:

applying an electrical pulse signal across said semiconductor layer at said desired region to lower the resistivity of said region; and

forming an electrode film on said desired region of said semiconductor layer opposite said conductive surface.

4,570,333

METHOD OF MAKING A PERMANENT MAGNET ROTOR

Donald W. Jones, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

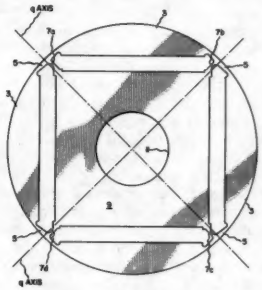
Division of Ser. No. 546,235, Oct. 28, 1983, Pat. No. 4,486,679. This application Aug. 13, 1984, Ser. No. 639,883

Int. Cl.⁴ H02K *15/02*

U.S. Cl. 29—598 **9 Claims**

1. A method of making a rotor for a permanent magnet machine comprising the steps of:

stacking a plurality of disk laminations, each disk lamination having pole piece sections connected by circumferential bridges located on the disk periphery, said pole piece sections and an interior core portion defining magnet slot thicknesses in the radial direction, a radial ligament connecting the interior core portion to each of the circumferential bridges, respectively, each of said radial ligaments being rotationally displaced to either side of the quadrature axes of the rotor along the axial direction, said stack



of laminations aligned so that said magnet slots extend through the stack in the axial direction;

placing said magnets in the magnet slots; and

pressing said bridges inwardly, plastically deforming said bridges and ligaments in a manner sufficient to create a predetermined hoop stress when the pressing force is removed, thereby holding said magnets in their respective slots, the rotational displacement of said radial ligaments ensuring columnar collapse in predetermined directions.

4,570,334

APPARATUS FOR ADJUSTING THE VALVE CONTROL OF A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

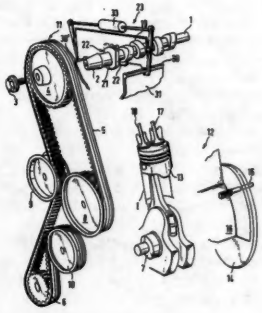
Harald Melzer, Neufahrn, and Joachim Hahn, Wolfratshausen, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Division of Ser. No. 406,045, Aug. 6, 1982, Pat. No. 4,461,062. This application Mar. 20, 1984, Ser. No. 591,586

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131278

Int. Cl.⁴ B23P *19/00;* **G01B** *3/38;* **B25B** *33/00*

U.S. Cl. 29—700 **6 Claims**



1. An apparatus for the adjustment of the valve control of a reciprocating piston internal combustion engine, said engine having a valve control housing, a crankshaft, a camshaft, a driving gear, an endless flexible transmission member drivingly

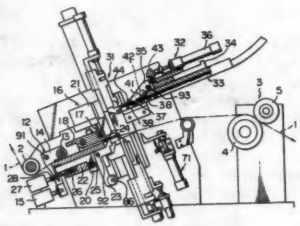
connecting the crankshaft with the driving gear, and threaded connecting means adapted to be loosened for drivingly connecting the driving gear with the camshaft by way of a frictional engagement, the camshaft including a member having edge surfaces disposed intermediate ends of the camshaft, the driving gear being adapted to be nonrotatably fixed with respect to the camshaft while the threaded connection is loosened by said transmission member, and said engine being cooperable with a means for nonrotatably fixing the crankshaft with respect to the crankcase when a piston in a reference cylinder is at top dead-center, the apparatus comprising adjustment means arranged transversely to separating surfaces of the valve control housing for nonrotatably fixing the camshaft relative to the valve control housing, said adjustment means including a beam-like element having abutment surfaces formed along a longitudinal side thereof for engaging the separating surfaces of the valve control housing, recess means of predetermined cross section provided along the longitudinal side of said beam-like element for receiving the member disposed on the camshaft, and securing means for fixing the adjustment means relative to the valve control housing, the recess means including complementary surfaces engageable with said edge surfaces wherein locking engagement of the recess means with member disposed on the camshaft and fixing of the adjustment means relative to the valve control housing non-rotatably fixes the camshaft relative to the valve control housing.

4,570,335

APPARATUS FOR INSERTING SLIDER FOR CONCEALED FASTENER

Shingo Hatagishi, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 28, 1984, Ser. No. 675,602
Claims priority, application Japan, Dec. 23, 1983, 58-243374
Int. Cl.⁴ A41H *37/06*
U.S. Cl. 29—768 **3 Claims**



1. An apparatus for inserting a slider for a concealed fastener which inserts a slider into a continuous concealed fastener chain alternately having element rows interlocked with each other and space portions in which no element is present, said apparatus comprising:

a feed device which feeds said fastener chain;

a slider holding device;

a slider supply device which supplied a slider into said slider holding device; and

a device which is adapted to sense said space portions and to stop said feed device such that said space portions are successively positioned with respect to said slider holding device,

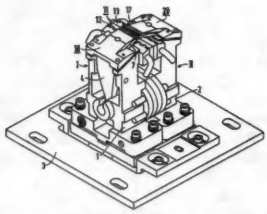
wherein said slider holding device includes: a slider holder which is adapted to receive a slider from said slider supply device and to support the same, with a pull of said slider hanging down; a device which moves said holder between an upper position where said slider is upwardly separate from said fastener chain and a lower position where said slider is in contact with said fastener chain so that bead portions of said fastener chain are allowed to be inserted into a channel in said slider; a pull guide having a pull groove which houses the pull of said slider; and a device which moves said pull guide between a lower position where said pull guide is downwardly separate from said fastener chain and an upper position where said pull guide extends such as to pass through one of the space portions of said fastener chain and to come in contact with or be adjacent to the slider within said slider holder, and wherein, when said pull guide is moved from said upper position to said lower position, said slider holder is moved from said upper position to said lower position together with said pull guide.

4,570,336

DEVICE FOR MOUNTING ELECTRONIC COMPONENTS TO CIRCUIT BOARD

Martin Richter, Marloffstein, and Josef Schweiger, Mohrendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,741
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 3340147
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 29—838 **19 Claims**



1. A device for mounting an electronic component having a plurality of contact pins to a circuit board provided with a plurality of openings, said contact pins being receivable by said openings, said device comprising:

support means including an anvil member for supporting the circuit board during insertion of the contact pins of the electronic component through the openings in said circuit board and for supporting said circuit board and said electronic component during subsequent bending and cutting operations;

fastening means including a plurality of knives comprising at least one stationary knife and a cooperating movable knife for bending and severing said contact pins upon insertion thereof through said openings, said stationary knife and said movable knife being disposed in the region of said anvil member, at least one of said knives having a cutting edge provided with a plurality of spaced parallel slots extending substantially transversely to said cutting edge, whereby said one of said knives is formed at said cutting edge with a plurality of cutting lugs;

plurality of strain gauge strips each connected to a respective one of said lugs;

monitoring means for detecting changes in the electrial resistances of said strain gauge strips; and

linking means for electrically coupling said monitoring means to said strain gauge strips.

17. A method utilizing the device of claim **1** for mounting the electronic component to the circuit board, said electronic component being provided with two parallel rows of contact pins, said method comprising the steps of:

placing said circuit board on said anvil member;

inserting the contact pins of said electronic component through the openings in said circuit board;

bending and severing said contact pins by said fastening means upon insertion of said contact pins through said openings;

transmitting electric currents through said strain gauge

strips via said linking means during said step of bending and severing;

detecting electrical resistances of said strain gauge strips via the electric currents applied to said strain gauge strips during said step of transmitting; and

comparing the detected electrical resistance of a strain gauge strip corresponding to a first contact pin in one of the rows on said electronic component with the detected electrical resistance of another strain guage strip corresponding to a second contact pin in the other of said rows to determine whether one of said first and said second contact pin was incorrectly inserted through a respective opening in said circuit board.

4,570,337

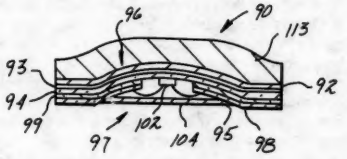
METHOD OF ASSEMBLING A CHIP CARRIER

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 369,785, Apr. 19, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 599,390

Int. Cl.⁴ H05K *3/34*

U.S. Cl. 29—840 **6 Claims**



1. The process of assembling a leadless chip carrier adapted for hermetically sealing a chip therein, comprising the steps of:

providing a first copper base alloy substrate having an indentation formed therein;

providing a copper base alloy circuit foil;

providing a copper base alloy cover;

providing a glass or ceramic sealing component having a coefficient of thermal expansion of at least about 160×10^{-7} in/in/°C., said coefficient of thermal expansion being closely matched to the coefficients of thermal expansion of said substrate, said circuit foil and said cover;

bonding said circuit foil to said substrate with said sealing component;

disposing the chip in said indentation;

bonding the chip to said substrate;

electrically connecting said chip to the circuit foil; and

bonding the cover to said circuit foil with said glass or ceramic sealing component for sealing said chip within said leadless chip carrier.

4,570,338

METHODS OF FORMING A SCREW TERMINAL

Alexander M. Ignatowicz, Rutherford, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Sep. 20, 1982, Ser. No. 419,367

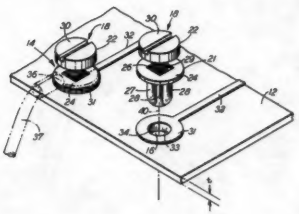
Int. Cl.⁴ H05K *3/30, 3/34;* H01R *4/02*

U.S. Cl. 29—845 **3 Claims**

1. A method of forming a screw tetminal in a support plate of a first predetermined thickness, which comprises:

rotatably inserting a screw into a first end of a tube of a length greater than the first predetermined thickness of the plate and of quadrilateral cross section to form threads in portions of the walls of the tube from such first end downward toward a second end of the tube to a depth within the tube at least equal to the first predetermined thickness of the support plate and less than the length of the tube, such that a portion of the tube adjacent to such second end remains unthreaded; and

inserting the tube into an aperture through the support plate by passing the unthreaded portion of the tube through the aperture and locating the threaded portion of the tube substantially within the aperture, said aperture having a circular cross section of a diameter less than a diagonal dimension across two nonadjacent edges of the tube,



whereby the edges of the threaded portion of the tube become interferingly lodged against the wall of the aperture, the unthreaded portion of the tube protruding from such support plate, such that upon inserting the screw by further rotation within the tube and forming further threads in such unthreaded portion of the tube, the walls of the tube yield and resiliently hold the screw without adding significant stress to the support plate.

4,570,339

KITCHEN UTENSIL FOR FOOD RETORT POUCHES

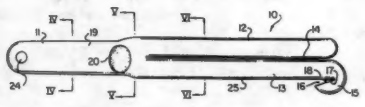
Larry W. Taylor, Rexdale, Canada, assignor to Magic Pantry Foods Inc., Mississauga, Canada

Filed Jun. 28, 1984, Ser. No. 625,699

Claims priority, application Canada, Feb. 15, 1984, 447544

Int. Cl.⁴ B26B *11/00*

U.S. Cl. 30—2 **12 Claims**



1. A kitchen utensil for facilitating the removal of the contents from a food item retort pounch made of a flexible material, said utensil comprising:

an elongated handle;

a pair of elongated prongs extending in parallel from the handle at one end thereof and defining a gap therebetween dimensioned to snugly receive two layers of said flexible material; and

a pouch opening device located at an end of one of said prongs remote from said handle, said pouch opening device comprising a lateral projection from said one of said prongs defining a slot having an open end facing said handle, and a blade traversing said slot.

4,570,340

TOOL HAVING A MULTI-POSITIONAL HANDLE

Douglas N. Shaw, Castle Rock, Colo., assignor to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Filed Jul. 25, 1984, Ser. No. 634,212

Int. Cl.⁴ B67B *7/00*

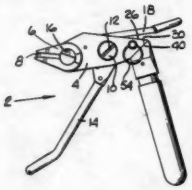
U.S. Cl. 30—123 **10 Claims**

8. In a band tightening and cutting tool having a body and a handle, an improvement comprising:

first member means extending from said body, said first mem-

ber means defining an outward-facing surface portion, and said surface portion comprising first and second surface areas which are substantially planar and which lie on different planes;

second member means extending from said handle, said second member means defining an outward-facing surface portion which is substantially planar and which is at an oblique angle relative to the longitudinal axis of said handle, and wherein said surface portion of said second member means can be



arranged to abut against said surface portion of said first member means in at least four alternative ways which correspondingly define at least four alternative angular orientations between the longitudinal axes of said body and said handle; and

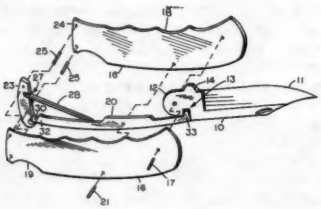
means for connecting said body to said handle in such a manner that one of said four alternative angular orientations between the longitudinal axes of said body and said handle can be maintained.

4,570,341

POCKETKNIFE WITH INTEGRAL RING FASTENER

Lloyd K. Konneker, 1810-A Ashborough Rd., Marietta, Ga. 30067

Filed Jun. 4, 1984, Ser. No. 617,023
Int. Cl.[4] B26B *1/04*
U.S. Cl. 30—161 **4 Claims**



1. An article of manufacture comprising, in combination, cutting means that includes a blade pivotably mounted to a blade housing and latching means for releasibly holding a key ring to said cutting means that includes cooperating catch means and latch means with said catch means defining a catch exit and said latch means being mounted for movement relative to said catch means into and out of positions restricting said exit, said latch means including a lockbar pivotably mounted to said blade housing for movement of a first lockbar end between a position closing said catch means exit to a position opening said catch means exit, and wherein a second end of said lockbar is spring biased into engagement with the tang of said blade.

4,570,342

RAZOR BLADE HOLDER

Wendell E. Baum, Ottumwa, Iowa, assignor to Cosco Industries, Inc., Spring Valley, N.Y.

Filed Jun. 21, 1984, Ser. No. 622,960
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—162 **1 Claim**

1. A device for holding a backed razor blade comprising:

a holder comprising a strip of sheet metal folded on itself to have first and second layers joined at one end, the blade being receivable between said layers adjacent the folded end, said strip at the folded end being cut away at one corner to receive and expose a corner of the blade and being rebated at an edge opposite the cut-away corner to receive the sides of the safety razor blade back, the layers of said folded strip being joined together at a point adjacent the end thereof opposite the folded end by striking the layers with a die from one side to form an indentation in one layer extending into the other layer to swage the layers together at the indentation and to form a boss in the other layer extending outwardly therefrom; and

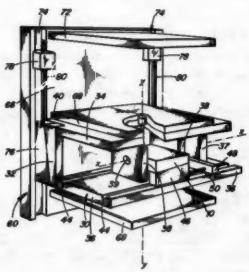
a sheath closely fitted about said holder and slidable thereon from a blade covering position in which the sheath covers the blade to a sheath retracted position in which the corner of the blade is exposed, said sheath further having a notch in one face thereof for receiving the boss of said holder and serving as a positive stop therefor when the sheath is moved to its retracted position, thereby to limit further movement of the holder and blade from the sheath.

4,570,343

PRECISION ALIGNMENT APPARATUS

Malcolm E. Bell, 314 Gladmer Park, Regina, Saskatchewan, Canada (S4P 2X2)

Filed Apr. 23, 1985, Ser. No. 726,237
Claims priority, application United Kingdom, May 3, 1984, 8411400
Int. Cl.[4] G01B *5/25*
U.S. Cl. 33—1 M **11 Claims**



1. An apparatus for orienting a device comprising:

an inner support;

an intermediate support;

an outer support;

first trunnion means mounting the inner support on the intermediate support for rotation about a first axis;

second trunnion means mounting the intermediate support

on the outer support for rotation about a second axis substantially orthogonal to the first axis;

a first pair of wedges engaging the inner support and the intermediate support on opposite sides of the first axis, with the wedges acting to rotate the inner support in opposite directions about the first axis;

a second pair of wedges engaging the intermediate support and the outer support on opposite sides of the second axis with the wedges acting to rotate the intermediate support in opposite directions about the second axis;

first lead screw means associated with each wedge of the first pair for advancing and retracting the wedge relative to the inner and intermediate supports; and

second lead screw means associated with each wedge of the second pair for advancing and retracting the wedge relative to the intermediate and outer supports.

4,570,344

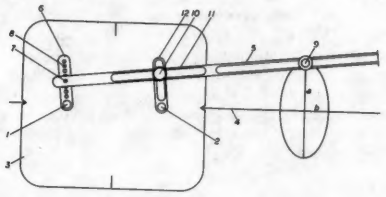
ELLIPSOGRAPH

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Dec. 6, 1984, Ser. No. 678,939

Int. Cl.[4] B43L *11/04*

U.S. Cl. 33—30.1 **1 Claim**



1. An ellipsograph comprising in general a mechanical instrument for drawing ellipses on a plane surface, and comprising in particular;

an elongate scriber arm (5) having a revolving end with a vertical pin (7) mounted therein, having a slotted middle section (11), and having a slotted end section with an inscriber (9) mounted to slide longitudinal therein,

a rectangular housing (3) mounted above the plane surface,

two vertical shafts (1,2) having upper ends and lower ends and being rotatably mounted in housing (3),

two parallel synchronized cranks (13,14) having inner pivoting ends attached to the lower ends of shafts (1,2) so as to rotate therewith, and having outer revolving ends attached to opposite ends of a connecting bar (15) which serves as synchronizing means.

a crank (6) having an inner pivoting end attached to the upper end of shaft (1) so as to rotate therewith and having a series of holes (8) to accommodate vertical pin (7) of scriber arm (5),

a crank (12) having a inner pivoting end attached to the upper end of shaft (2) so as to rotate therewith and having a slot in the middle and outer portions thereof,

a set screw (10) engaging and lockable to the slot of crank (12) and engaging so as to slide longitudinally in the slotted middle section (11) of scriber arm (5).

4,570,345

HOLDING AND MARKING FIXTURE FOR FLAT SHEETS

Joseph M. Cattadoris, 211 Booth St., Utica, N.Y. 13502

Filed Sep. 6, 1984, Ser. No. 648,036

Int. Cl.[4] B43L *13/00*

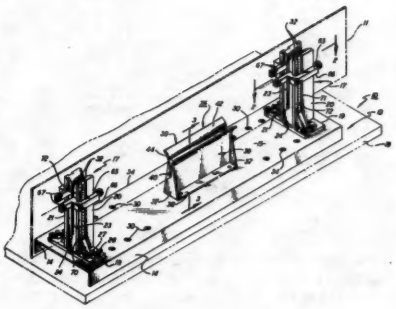
U.S. Cl. 33—32 G **8 Claims**

1. Apparatus for laying out flat sheets of material that includes

a base that includes a flat horizontal working surface and a pair of spaced apart vertically disposed support towers mounted upon the working surface,

each of said support towers having a front column and a rear column that are separated by a slotted opening, said slotted openings both lying in a common support plane and having bottom walls that are at the same elevation over the working surface of the base whereby a flat sheet mounted in the slots is supported in a vertical position,

at least one horizontally disposed straight edge member slidably supported in corresponding columns in each tower so that the straight edge members can be vertically repositioned on the same side of a sheet supported between the towers,



a horizontally disposed marking guide depending from each of said straight edge members, parallel with said common support plane, said guide having a horizontal edge for guiding a marking tool over the surface of a sheet to mark a straight line thereon,

scale means carried upon each column for accurately locating the straight edge members and,

releasable locking means associated with each straight edge member for releasably engaging the receiving column and thus securing the said member at a desired position in regard to a sheet mounted between the towers.

4,570,346

LENGTH OR ANGLE MEASURING DEVICE

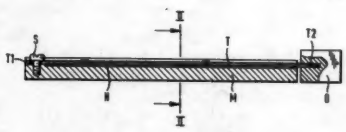
Horst Burkhardt, Truchtlaching, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,864

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315214

Int. Cl.[4] G01B *11/04*

U.S. Cl. 33—125 R **11 Claims**



1. In a length or angle measuring system of the type comprising a scale carrier body and a measuring scale connected to the carrier body so as to be slightly shiftable with respect thereto, said system capable of detecting measuring scale distortion caused by differential temperature fluctuations, the improvement comprising:

at least one vibration generator which is connected to vibrate at least one of the scale and the carrier body to

reduce distortional forces applied to the scale from differential thermal expansion of the scale and carrier body.

4,570,347

SEALING ARRANGEMENT FOR INCAPSULATED MEASURING INSTRUMENT

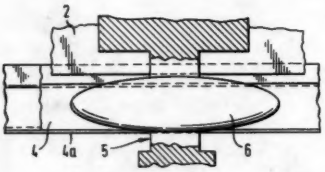
Walter Miller, Traunstein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 3, 1985, Ser. No. 688,607

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400395

Int. Cl.[4] G01B *11/04*; F16J *15/40*

U.S. Cl. 33—125 R **9 Claims**



1. In an encapsulated measuring instrument for measuring the position of first and second objects movable relative to each other, of the type having a housing connected to said first object, said housing having at least one slit running in the direction of movement of said second object, and a follower passing through said slit connecting said second object with said measuring instrument, the improvment comprising:

at least one enlargement smoothly curved in three dimensions, said enlargement comprising two tapered ends along an axis defined by said slit, said enlargement located on said follower, said enlargement extending beyond the cross-sectional dimension of said follower in the region where said follower passes through said slit; and

flexible sealing means for covering said slit around said follower and capable of producing resilient forces, said sealing means comprising first and second flanks, each of said first and second flanks comprising an inner concave surface shaped to conform to and contact with resilient force said enlargement, said first flank positioned to overlap said second flank and cooperate with said second flank to seal said slit with said resilient force when not separated by said follower;

said tapered ends cooperating with said inner concave surface of said first and second flanks to gradually spread said flanks apart and to allow said flanks to gradually resume said overlap position in the area of passage of said follower while said resilient force of said flanks against said enlargement maintains the seal of said slit

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4,570,348

MEASURING APPARATUS

Jerry D. Amsler, 202 Keystone, and Robert E. Furrow, 209 E. Birch, both of Enid, Okla. 73701

Filed Sep. 24, 1984, Ser. No. 653,432

Int. Cl.[4] G01B *5/04*

U.S. Cl. 33—129 **13 Claims**

1. A measuring apparatus comprising:

a substantially planar frame;

a first axle support mounted on the upper side of said frame;

a first axle mounted on said first axle support;

a first roller rotatably mounted on said first axle;

a second axle support mounted on the upper side of said frame;

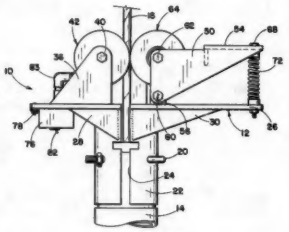
a second axle mounted on said second axle support;

a second roller rotatably mounted on said second axle, said first and second axles being substantially parallel and the edges of said rollers being opposite one another;

a tubular base extending downwardly from the lower side of said frame with the axis of said base being at a substantially right angle to said frame;

an opening in said frame to permit communication between the interior of said base and the upper side of said frame;

a first slot formed in said frame and extending from one edge thereof to said opening;



a second slot formed axially in said tubular base along the length thereof, said first and second slots being in alignment with one another;

a magnet mounted on one of said rollers adjacent the circumference thereof; and

means for detecting a magnetic field mounted on said frame adjacent the circumference of the roller having said magnet mounted thereon.

4,570,349

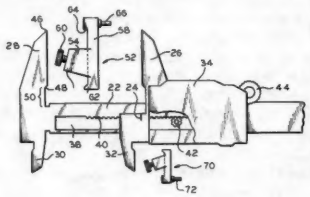
PRECISION ELECTRONIC MEASURING INSTRUMENTS

Steven L. Finkelman, Chicago, and Moshe Tseitlin, Lincolnwood, both of Ill., assignors to M. Y. Finkelman Company, Chicago, Ill.

Filed Mar. 2, 1984, Ser. No. 585,910

Int. Cl.[4] G01B *7/14*

U.S. Cl. 33—143 L **10 Claims**

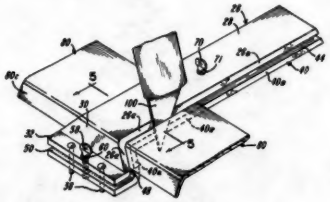


1. An electronic measuring instrument comprising a set of jaws mounted for one of said jaws to move toward or away from the other of said jaws, each of said jaws having a point on one end with a step and relief area on the other end with a straight section therebetween, electronic read out means responsive to the movement of said one jaw for indicating a relative distance between said jaws, adapter means for fitting over and locking to said jaws, said adapter means comprising a pocket having a straight section on one side with a step on one end and a foot on the other end of said straight section, said step on said adapter fitting over said point on said jaw and said foot fitting over said step and into said relief area on said jaw, and pins in each of said adapter means projecting from said jaws to enable them to measure odd and irregular shapes.

4,570,350
APPARATUS AND METHOD FOR FORMING WALL BASE COVED TRIM STRIP MATERIAL

Jesse L. Cullison, 7801 Washington Park Dr., Dayton, Ohio 45459

Filed Oct. 26, 1984, Ser. No. 665,007
Int. Cl.[4] G01B 3/00
U.S. Cl. 33—562 15 Claims



1. Apparatus for use in forming the end of a strip of wall base trim material for positioning within an inside corner or at an outside corner of a wall, the strip of wall base trim material having a coved portion along the length thereof, comprising:

a first clamp member, the first clamp member being provided with a substantially flat body portion and an offset portion which extends angularly from the body portion and a foot portion which extends angularly from the offset portion, the body portion and the offset portion of the first clamp member having opposed side edge surfaces which are angular with respect to said portions, the body portion of the first clamp member having a given width dimension, the foot portion of the first clamp member having a width dimension greater than said given width dimension of the body portion, the offset portion having a gradually increasing width dimension extending between the body portion and the foot portion,

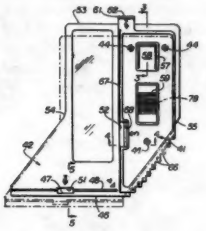
a second clamp member, the second clamp member being provided with a substantially flat body portion and an offset portion which extends angularly from the body portion and a foot portion which extends angularly from the offset portion, the body portion and the offset portion of the second clamp member having opposed side edge surfaces which are angular with respect to said portions, said portions of the second clamp member being positioned above the corresponding portions of the first clamp member, said portions of the second clamp member being narrower in width than the corresponding portions of the first clamp member, the clamp members being adapted to receive a part of a strip of base wall trim material therebetween, with the coved portion of the strip material between the offset portions of the clamp members, the side edge portions of the first and second clamp members being substantially in the same plane when a part of a strip of base trim material is positioned between the first clamp member and the second clamp member, for receipt of a cutting member which is moved along the side edge surfaces at one side of the first clamp member and the second clamp member.

4,570,351
BOOK CORE GAUGE AND POSITIONING GUIDE FOR CASING BOOK CORES

Elmer G. Szanto, Saratoga; Franklin J. Davio, Burbank, and Lloyd V. Wallace, Thousand Oaks, all of Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Filed Aug. 24, 1984, Ser. No. 643,868
Int. Cl.[4] G01B 5/00
U.S. Cl. 33—180 R 9 Claims

1. A device of the character described comprising a base member having a bottom edge, a slidable member on a first side of said device partially overlapping said base member, means for guiding said slidable member for movement at an acute angle relative to said bottom edge, a book case bottom stop on said base member on the second side of said device, a book case side stop on said second side perpendicular to said bottom

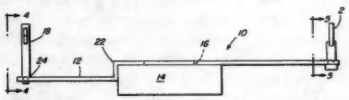


edge, a book core bottom stop on said first side parallel to and spaced away from said book case bottom stop, and a book core side stop on said slidable member on said first side parallel to said book case side stop.

4,570,352
BOW SIGHT

Manuel J. Leal, 62 Liberty St., East Taunton, Mass. 02718

Continuation of Ser. No. 561,225, Dec. 14, 1983, abandoned.
This application Aug. 22, 1985, Ser. No. 767,710
Int. Cl.[4] F41G 1/46
U.S. Cl. 33—265 9 Claims



1. Archery bow sight to compensate for range variations to a target comprising:

an elongate mount having a major axis attached to the archery bow, the mount including front and rear sight attachment points separated by predetermined, fixed distance along the major axis;

a rear sight attached to the rear sight attachment point on said mount and extending upwardly from the mount, the rear sight including a frame supporting a pair of cross-hairs; and

a front sight attached to the front sight attachment point on said mount and extending upwardly from the mount, the front sight terminating in a plurality of locating projections spaced apart in a direction transverse to the major axis of the mount, whereby the cross-hairs are aligned with one of the locating projections on the front sight according to the range to the target.

4,570,353
MAGNETIC SINGLE SHOT INCLINOMETER

John L. Evans, and Larry R. Russell, both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 31, 1984, Ser. No. 687,602
Int. Cl.[4] E21B 47/022
U.S. Cl. 33—313 14 Claims

1. An apparatus for measuring the inclination and azimuth of a borehole, comprising:

a housing;

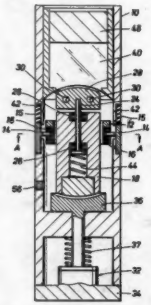
a lens connected to said housing and having a concave surface;

a pendulous support having a lower surface, an upper convex surface in contact with the concave surface of said

lens, and a longitudinal axis which intersects the upper, convex surface of said support;

a compass connected to said support so that the magnetic poles of said compass are diametrically opposed about the longitudinal axis of said support;

an actuator connected to said housing and having a surface in contact with the lower surface of said support, wherein said actuator can be manipulated to lower said support from contact with said lens and to raise said support into contact with said lens;



a pivot in contact with the lower surface of said support at a point which intersects the longitudinal axis of said support; and

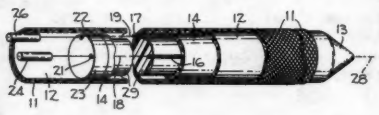
a spring located between said pivot and said actuator for urging said pivot and said support away from contact with said actuator as said actuator lowers said support from contact with said lens, thereby permitting said compass to rotate said support about its longitudinal axis and permitting pivotal movement of said support about said pivot.

4,570,354

RADIUS OF CURVATURE TRANSDUCER

Charles S. Hindes, Poway, Calif., assignor to Humphrey Inc., San Diego, Calif.

Filed Aug. 3, 1984, Ser. No. 637,547
Int. Cl.[4] G01B 7/28
U.S. Cl. 33—534 **20 Claims**



1. A curvature transducer, comprising

a transducer body flexible in a bending mode and having an elongate neutral axis of substantially constant length in said bending mode,

a flexible elongate member fixed at one end thereof to said body and laterally spaced from said neutral axis,

means for maintaining said elongate member at said laterally spaced position relative to said neutral axis during all modes of bending, and

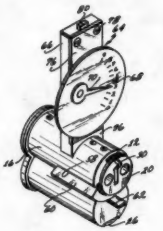
sensing means coupled to the other end of said elongate member for sensing the translational movement of said other end relative to said transducer body.

4,570,355

APPARATUS AND PROCESS RELATED TO KEYING A LOCK WITH A CONTROL KEY

William De Forrest, 1825 Via Burton, Anaheim, Calif. 92806

Filed Jul. 27, 1984, Ser. No. 635,106
Int. Cl.[4] G01B 3/28
U.S. Cl. 33—539 **13 Claims**



1. In combination with a pin-tumbler lock cylinder of the type having a key plug nested within a control cylinder which, in turn, is nested within a main body cylinder and including at least one bore extending radially through said key plug, said control cylinder and said main body cylinder: a pin-tumbler located in said bore, said pin-tumbler composed of a plurality of pins; said key plug rotatable in said control cylinder utilizing a first key and the combination of said key plug and said control cylinder rotatable in said main body cylinder utilizing a control key:

a device for determining the pin-tumbler size for said control key which comprises:

a body;

said body including a cylinder mating face, said cylinder mating face arcuately shaped in cross section and sized to intimately fit against the outside surface of said main body cylinder immediately adjacent said bore;

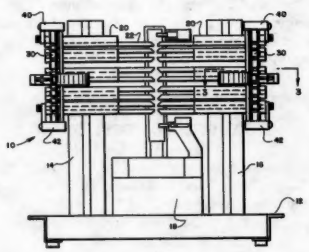
a probe means located on said body in association with and extending away from said mating face, said probe means being elongated and having an end, said probe means of a cross sectional dimension smaller than the cross sectional dimension of said bore, said probe means for fitting into said bore and contacting said pin-tumbler located therein with said end of said probe means.

4,570,356

ELEVATOR INDICATOR SUPPORT-BOW GAGE ASSEMBLY

Martin A. Herman, 2085 W. 114th St., Cleveland, Ohio 44102

Filed Jan. 20, 1984, Ser. No. 572,528
Int. Cl.[4] G01B 5/20
U.S. Cl. 33—552 **10 Claims**



1. An elevator type gage assembly for attachment to a gage having a plurality of vertically spaced support members

therein and gage templates slidably carried by said support members for engaging a test article and comprising:

a vertically extending support rod operatively positioned by and extending between a pair of said support members;

an indicator sleeve bracket slidably engaging said support rod and having a portion thereon for engaging a laterally outer end of a support member;

an indicator secured to said indicator sleeve bracket and having an operating device extending therefrom, and

a contact arm pivotally carried by said indicator sleeve bracket, said contact arm having an end portion for engaging a laterally outer end of a gage template and an end portion for engaging said operating device of said indicator whereby said contact arm will provide a reading on said indicator to show a size of a test article engaged by a said gage template.

4,570,357

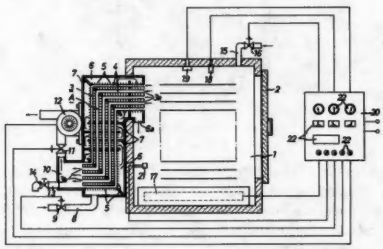
HEAT-TREATING PROCESS AND ITS APPARATUS IN REDUCING AIR PRESSURE WITHIN A CHAMBER

Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamori-Mura, Kamihei-Gun, Iwate-ken, Japan

Filed May 2, 1984, Ser. No. 606,359

Int. Cl.[4] F26B *3/04*

U.S. Cl. 34—15 2 Claims



1. A process for heat-treating at a reduced air pressure within an airtight chamber comprising:

forcibly suctioning air from within said airtight chamber;

maintaining a difference between said air pressure within said chamber and a normal air pressure thereoutside at a preferred preset level;

heating said air within said airtight chamber to a preferred predetermined temperature by a heat source disposed therewithin;

discharging a heated air having a vapor content from said airtight chamber;

heat-exchanging cold outer air introduced into said airtight chamber from the outside thereof with a thermal energy of said heated air being discharged from said airtight chamber; and

the step of maintaining a difference including controlling a control valve at an inlet end of an outer air inlet means to admit a controlled amount of outer air to said airtight chamber before the step of heat exchanging, whereby the pressure in said airtight chamber is controlled at said reduced air pressure and said controlled amount of air passing through said airtight chamber carries off said heated air having a vapor content from said airtight chamber.

4,570,358

SPORTS RACKET HANDLE DRYING DEVICE

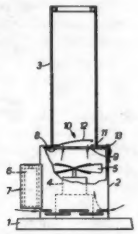
Giacomo M. Sacerdote, Cobham, England, assignor to Ypsilon Limited, London, England

Filed Oct. 24, 1983, Ser. No. 544,833

Claims priority, application United Kingdom, Nov. 15, 1982, 8232581

Int. Cl.[4] F26B *9/06*

U.S. Cl. 34—54 4 Claims



1. A sports racket handle drying device, the device comprising:

upwardly extending tube means for receiving and holding a downwardly inserted sports racket handle to be dried, said tube means comprising a single tube having a first upper end and a second lower end, said first and second ends being open to permit passage of air axially along the length of the tube and the opening at said first end being sized to permit entry of said handle into the tube and passage of air in a peripheral space between said handle and said tube, said tube being imperforate so as to permit air flow from one end to the other of the tube only;

an electrically operated fan mounted adjacent the second end of the tube and lying in an air flow path passing axially through said tube between said first and second ends; and

actuating means adapted to actuate said electrically operated fan in response to insertion of the handle in the tube to effect an axial flow of air in said peripheral space.

4,570,359

APPARATUS FOR THE DEWATERING AND DRYING OF PLASTIC GRANULATE

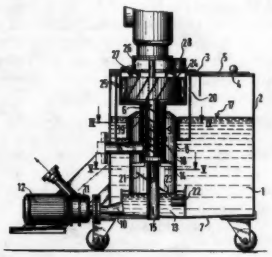
Joachim Rudolph, Weil der Stadt, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,385

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 3328303

Int. Cl.[4] F26B *17/18*

U.S. Cl. 34—58 14 Claims



1. Apparatus for dewatering and drying plastic granulate comprising a housing, multistage dewatering means in said

housing and including first and second dewatering stages arranged in axial succession, a screen surrounding said dewatering means, said first dewatering stage comprising a rotor including conveying and aerating vanes for conveying dewatered granulate in a given direction to said second dewatering stage, product inlet means leading to said first stage of said dewatering means, product outlet means for discharge of dewatered granulate from said housing, a collecting container in said housing having an open top and a closed bottom, said collecting container surrounding said screen in said first dewatering stage for collecting water removed in said first dewatering stage, a feed vessel secured within said collecting container and connected to said inlet means, suction pump means connected to said collecting container for removing water therein, said conveying and aerating vanes on said rotor in said first stage comprising a worm segment helically wound on said rotor with increasing pitch in the direction of conveyance of granulate and a fluff filter secured in said housing around said screen, said fluff filter surrounding said second conveyor stage and said collecting container at said first conveyor stage.

4,570,360

HOPPER DRIER

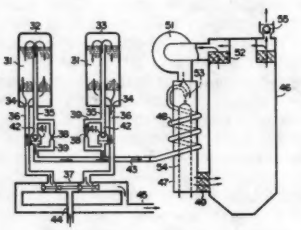
Shoji Nakagomi, 518-1, Shirakuwa, Urawa-shi, Saitama, Japan

Filed May 7, 1984, Ser. No. 607,366

Claims priority, application Japan, May 7, 1983, 58-68039[U]

Int. Cl.⁴ F26B *17/14*

U.S. Cl. 34—80 **9 Claims**



1. A hopper drier comprising;

a hopper drier housing adapted to hold therein granular material of synthetic resin to be supplied to a molding machine, said hopper drier housing being formed with a dry hot air introducing port at the lower end part and two discharging ports at the upper end part thereof, one of said discharging ports being in communication with the suction side of a blower,

first and second dehumidifying means having dehumidifying material filled therein to prepare dehumidified air to be supplied to the hopper drier housing, each of said dehumidifying means being formed with a first introducing and discharging port at the lower end part and a second introducing and discharging port at the upper end part thereof, said first introducing and discharging port being in communication with an air delivery pipe via a first switching valve through which compressed air is delivered and said second introducing and discharging port being in communication with an air discharging pipe via a second switching valve,

a heating column of which one end is in communication with the delivery side of the blower and of which the other end is in communication with the introducing port at the lower end part of the hopper of the drier housing, said heating column including a heating pipe spirally wound round the heating column for preheating dehumidified air of which one end is connected to the air delivery pipe, a nozzle connected to the other end of said heating pipe to supply into the heating column dehumidified air which has been preheated while flowing through the heating pipe and a heater disposed in the heating column to heat up to a predetermined temperature the mixture of air discharged through said nozzle and air blown from the blower, and

said first switching valve being operated such that when compressed air is supplied into the one dehumidifying means, waste air is discharged from the other dehumidifying means to the outside environment and said second switching valve being operated such that dehumidified air is delivered from the one dehumidifying means to the heating pipe and a part of dehumidified air coming from the one dehumidifying means is introduced into the other dehumidifying means.

4,570,361

SIEVE DRUM DEVICE WITH FLAME HEATING

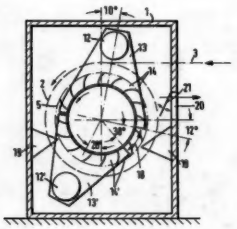
Heinz Fleissner, Riehen, Switzerland, assignor to Vepa Aktiengesellschaft, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,241

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123564

Int. Cl.⁴ F26B *13/22*

U.S. Cl. 34—115 **12 Claims**



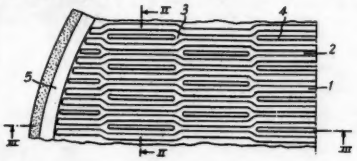
1. A device for drying textile material which comprises a closed housing accommodating a conveying means comprising at least one sieve drum that is under a suction draft and that is covered to prevent flowthrough of gases in a zone of the drum not contacted by the textile material, a fan associated with an end face of said sieve drum for withdrawing a treatment gaseous medium from an interior of the sieve drum and for blowing the treatment gaseous medium back into a space around the sieve drum, an annular gap provided between a fan intake connection and a wall having a drum spider for supporting the sieve drum, said gap being surrounded by two annular ducts which open toward the gap and in each of which is located a burner of a direct flame heating unit, said annular ducts being spaced from each other and each annular duct adjoining and being associated with a selected arcuate portion of the fan intake connection; an upper annular duct being associated with a topside zone of the fan intake connection and a lower annular duct being associated with an underside of the fan intake connection, each burner and associated annular duct being positioned from a perpendicular plane extending through an axis of rotation of the fan by an angle of rotation with respect to the fan and each of the burners being arranged, respectively, at the topside and at the underside in front of the perpendicular plane at an arcuate distance extending in a direction opposite to the direction of rotation of the fan and the lower annular duct being spaced from the upper annular duct to define a recessed zone wherein no flame gases from the burners are fed to the intake connection of the fan and said closed housing having an exhaust gas outlet associated with said recessed zone whereby the gaseous medium discharged into said exhaust gas outlet is not heated by the flame gases.

4,570,362

ELASTOMERIC SUPPORT SURFACE WITH A NETWORK OF SCULPTURES, NOTABLY A SO-CALLED "MARINE" SHOE SOLE

Christian Vermonet, Cholet, France, assignor to Societe Technisynthese s.a.r.l., Saint Pierre Montlimart, France

Filed Oct. 2, 1984, Ser. No. 656,908
Claims priority, application France, Oct. 19, 1983, 83 16639
Int. Cl.[4] A43B *5/06, 5/00;* B60C *11/06;* A47G *29/00*
U.S. Cl. 36—59 C 5 Claims



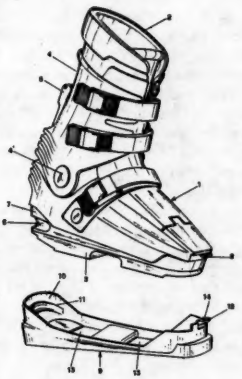
1. An elastomeric support surface with a network of sculptures formed in known manner by a transverse network of narrow channels leaving therebetween protruding ribs the free edges of which form the bearing surface, wherein the network of channels is formed with periodical widened portions of each channel, a tong, having a width less than the width of the walls defining the channel and a height equal to the depth of the channel, being provided axially in each widened portion.

4,570,363

SKI BOOT WITH A NORMALIZED SOLE

Giuseppe Annovi, Montebelluna, Italy, assignor to Dolomite, S.p.A., Montebelluna, Italy

Continuation-in-part of Ser. No. 306,386, Sep. 28, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,365
Claims priority, application Italy, May 13, 1983, 61940/83[U]
Int. Cl.[4] A43B *5/04, 3/24*
U.S. Cl. 36—117 6 Claims



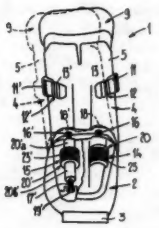
1. A ski boot having a sole and foot portion constructed for comfortable walking when a wearer is not engaged in skiing, a normalized sole attachment separate from the ski boot and being of a size, shape and hardness to be engageable with substantially any ski binding but rendering normal walking during non-skiing activity very difficult and uncomfortable, and said ski boot having a leg portion articulated thereto, means to lock the leg portion substantially rigidly in a desired angular position while skiing, said normalized sole having at least a lower opening for the discharge of ice or snow accumulated under the foot portion during walking, rear interengaging means between the foot portion and the normalized sole, and pressure-releasable locking lever means between the foot portion and normalized sole substantially at the forward ends thereof.

4,570,364

ARTICLE OF ATHLETIC FOOTWEAR, ESPECIALLY A SKI BOOT

Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland

Filed Feb. 17, 1984, Ser. No. 581,067
Claims priority, application Switzerland, Feb. 23, 1983, 999/83
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—121 22 Claims



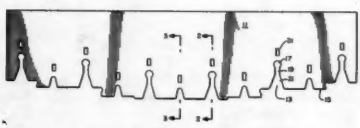
1. A ski boot, comprising:
a lower shaft portion having a sole member and a transverse axis;
a shin portion mounted to pivot about said transverse axis relative to said lower shaft portion and intended to cover a shin region of a leg of a wearer of the ski boot and forming an upper shaft portion thereof;
adjustment means for adjusting the attitude of said shin portion relative to the lower shaft portion;
said adjustment means including at least two mutually independently operable adjusting mechanisms each having two ends;
a respective one of said two ends of each of said at least two adjusting mechanisms operatively engaging the lower shaft portion of the ski boot at a respective engagement point;
a respective other one of the two ends of each of the at least two adjusting mechanisms operatively engaging the shin portion of the ski boot at a respective other engagement point; and
the mutual positional interrelation of each of said respective engagement points at the lower shaft portion and at the shin portion being variable and adjustable.

4,570,365

DIGGING TOOTH AND BUCKET LIP CONSTRUCTION

Robert S. Bierwith, 1331 Eastshore Hwy., Berkeley, Calif. 94710

Filed Nov. 23, 1983, Ser. No. 554,598
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—141 T 1 Claim



1. A digging tooth and bucket lip engagement construction for the forward edge of a plate metal bucket lip comprising
a multiplicity of slots in said plate metal bucket lip having a vertical partial cylindrical configuration at the rear end

thereof with a radius of curvature of generation approximately equal to one-half or greater than one-half the width of the slot immediately adjacent and forward of the cylindrical section, every other of said slots having a constant width portion immediately forward of said cylindrical portion and an expanding width portion being widest at the front edge of said lip and narrowing to merge with the constant width portion of said slot rearward of said lip edge, the rest of said slots not having constant width portions but only expanding width portions, said slots being spaced to dispose each of said tooth supporting structures in close relation to each other along the front edge of said bucket lip,

a locking clamp hole disposed in said lip rearward of each of said slots,

a bucket tooth supporting structure disposed in each of said slots, said structure having a bucket lip engaging portion including a web portion and top and bottom cap portions secured to opposite ends of said web portion, said web portion being disposed in said slot and having a width to fill the slot in said lip except for the rear end thereof which is not wider than the narrowest width of the slot so that the tooth can be removed from the lip by sliding the tooth forward out of the slot, said cap portions of said tooth supporting structure clamping onto opposite sides of said bucket lip adjacent to said slot and covering said slot for the length thereof and extending rearward of said slot on opposite sides of said plate in close relation thereto thereby sandwiching said plate metal bucket lip to provide structural support to said lip and in effect form a substantially thicker metal plate lip in the area of said support structure, the rearward projection of said cap portions from the rear end of said slot being a substantial portion of the length of said tooth supporting structure, said cap portions of said support structure also covering opposite sides of said plate metal bucket lip laterally from said slot for a distance on each side thereof approximately equal to the height of the web of said tooth supporting structure,

means for securing a tooth to said supporting structure,

locking clamp holes disposed at the rearward end of each of said tooth supporting structures extending through both the top and bottom cap portions, and

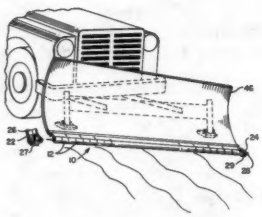
a quick release locking clamp engaging each of said tooth supporting structures and said plate metal lip to hold said structures engaged with said lip when disposed in operating position on said lip.

4,570,366

SNOWPLOW AND BLADE HAVING TRIANGULAR ROTATABLE CUTTING BLOCK TEETH

Kenneth J. Yost, 10 Candy Ct., Eaton, Ohio 45320

Filed Aug. 10, 1984, Ser. No. 639,568
Int. Cl.⁴ E01H *5/04*
U.S. Cl. 37—232 **12 Claims**



1. A blade assembly for attachment to the moldboard of a snowplow comprising:

at least one block forming a blade and having a triangular-shaped cross-section, said at least one block having a leading edge for engaging snow to be plowed;

means for mounting said at least one block on said blade assembly such that when said leading edge of said at least one block encounters an obstacle, said leading edge rotates rearwardly, overrides said obstacle, and returns the succeeding surface of said at least one block to a snow-engaging position: and

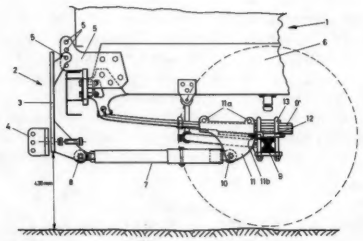
means for attaching said blade assembly to the moldboard of a snowplow.

4,570,367

FRONT-MOUNTED, SHOCK-ABSORBING ATTACHMENT MEANS FOR A SNOWPLOW ON A VEHICLE

Anders Oya, Fiane, Norway, assignor to Stiansen & Oya A/S, Fiane, Norway

Filed Jan. 23, 1985, Ser. No. 694,158
Claims priority, application Norway, Jan. 23, 1984, 840237
Int. Cl.⁴ E01H *5/04*
U.S. Cl. 37—232 **5 Claims**



1. A front-mounted, shock-absorbing attachment means (2) for a snowplow on a vehicle (1), comprising a substantially vertical front plate (3) with fastening means (4) for detachable mounting of the snowplow, wherein the upper section of the front plate (3) is pivotally fastened (5) to the frame (6) of the vehicle, and the lower section of the front plate (3), via buffer cylinders (7) whose length is adjustable and one end of which is pivotally attached (8) to the front plate (3), is supported against the front wheel axle (9) of the vehicle, said axle being attached to longitudinal leaf spring assemblies (9') connected to the frame (6) of the vehicle (1), characterized in that the other ends of the buffer cylinders (7) are pivotally fastened to a point (10) situated lower than the leaf spring assembly (9') and in front of the front wheel axle (9) by means of respective brackets (11) which are rigidly clamped to respective leaf spring assemblies (9') in front of the front wheel axle (9) and which rest directly or indirectly against the spring assembly (9'), whereby when the buffer cylinders (7) are subjected to loading from the front plate (3), the cylinders (7) will become somewhat compressed and this will cause the bracket (11) to pivot backwardly about its point of contact on the front wheel axle (9), thereby bending the leaf spring assembly (9') downwardly in front of the front wheel axle (9), which causes the front plate (3) to pivot backwardly somewhat about its pivotal supports (5) on the vehicle frame (1).

4,570,368

LABEL FOR PLANTS AND NURSERY STOCK

Gary L. Stover, Ormond Beach, Fla., assignor to Economy Label Sales, Inc., Daytona Beach, Fla.

Filed Mar. 25, 1985, Ser. No. 715,386
Int. Cl.⁴ G09F *3/18*
U.S. Cl. 40—10 C **6 Claims**

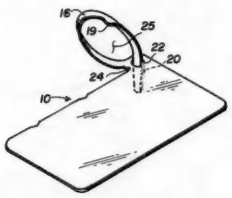
1. A label for a plant comprising:

an essentially rectangular card formed from thin, flexible stock and having a hole therethrough in a first corner thereof;

a narrow tongue having a free distal end, and a proximal end

attached to said card adjacent to said first corner thereof, said tongue defined by a cut along one edge of said card;

at least two tabs projecting from an edge of said narrow tongue; and



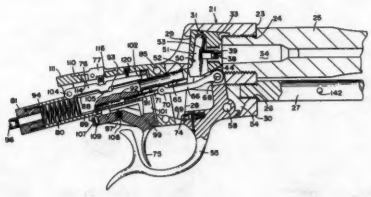
a loop for encircling a part of a plant to be labelled formed by pulling said free distal end of said tongue through said hole until a selected one of said tabs ratchets through said hole.

4,570,369

CYLINDRICAL, FALLING BREECH BLOCK, RIFLE ACTION

Raymond F. Gerfen, 7057 Autumn Chase, San Antonio, Tex. 78238

Filed Sep. 27, 1983, Ser. No. 536,386
Int. Cl.[4] F41C *11/04, 7/06*
U.S. Cl. 42—23 **5 Claims**



1. A falling breech block rifle action comprising

a receiver adapted to receive a chambered barrel,

an essentially cylindrical breech block movable angularly upwardly and downwardly in said receiver, said breech block including upper and lower portions,

a hand lever pivotally mounted in said receiver to raise and lower said breech block,

a recess in said receiver adapted to receive said upper portion of said breech block in raised condition of said breech block,

a trigger housing connected to said receiver,

said trigger housing comprising a striker, sear, trigger, and safety block,

a cocking bar connected to said hand lever and adapted to bear remotely against said striker to effect cocking of said striker,

said sear adapted to engage said striker in cocked condition, and

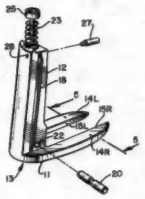
said safety block adapted to lock said trigger, sear and striker in cocked condition.

4,570,370

WIDE ANGLED GUN MAGAZINE ENTRANCE GUIDE OPENING

Alan K. Smith, 211 Betty Dr., Richardson, Tex. 75081, and Stephen R. Alexander, 814 Scottsdale Dr., Richardson, Tex. 75080

Filed Mar. 12, 1984, Ser. No. 588,394
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **10 Claims**



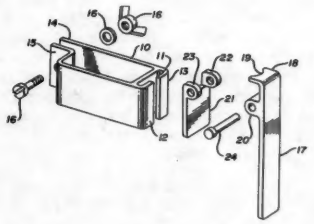
1. A wide angled gun magazine entrance guide for easier and faster insertion of fresh magazines into a gun receiver comprising: extension means integral with a gun mainspring housing mounted on the back of a gun grip; said extension means being formed with a bifurcated two arm portion extending forwardly from the reward bottom extension of said gun mainspring housing; said bifurcated two arm portion underlying the bottom of the gun grip with said arms so spaced as to be in alignment with opposite sides of the gun magazine receiver opening; and wherein said arms of said two arm portion have downward facing beveled surfaces angled toward the magazine receiver opening so as to guide a magazine being moved toward the opening from below smoothly and easily into the opening for easy and fast smooth insertion of magazines into the gun receiver opening.

4,570,371

RAPID LOADER DEVICE

Lawrence N. Mears, Niles, Ohio, assignor to Center Line Industries, Inc., Warren, Ohio

Filed Oct. 9, 1984, Ser. No. 658,660
Int. Cl.[4] F41C *27/00*; F42B *39/06*
U.S. Cl. 42—90 **2 Claims**



1. A rapid loader device for a firearm magazine comprising a clamping support bracket engagable on said magazine, a loading lever having a right angularly disposed end portion and means for removably attaching said loading lever to said clamping support bracket, said right angularly disposed end portion being spaced in relation to said clamping support bracket, means for securing said clamping support bracket to said magazine, said means for securing said clamping support bracket to said magazine comprising a pair of spaced apertured tabs extending from said clamping support bracket and a fastener assembly engaging said apertured tabs for moving said apertured tabs toward one another.

4,570,372

EARTHWORM HARVESTING METHOD

Peter Lukas, Toronto, Canada, assignor to P.M. Sports Development Limited, Mississauga, Canada

Filed May 15, 1984, Ser. No. 610,374

Claims priority, application United Kingdom, May 17, 1983, 8313621

Int. Cl.[4] A01K 97/00

U.S. Cl. 43—1 8 Claims

1. A method of harvesting worms from ground soil which comprises:

forming a solution containing about 12 to 30 ppm chlorine in water by dissolving a solid tablet containing by weight about 1 to 10% sodium sulphate and the balance a metal oxychloride in water;

pouring said solution on ground soil containing worms causing said worms to emerge from the ground; and collecting said worms.

4,570,373

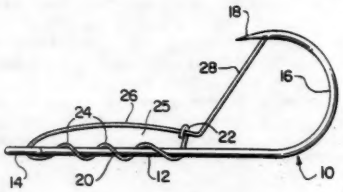
BARBLESS FISHHOOK

John D. Brief, Rte. 11, Box 215, Tyler, Tex. 75709

Continuation-in-part of Ser. No. 549,499, Nov. 7, 1983, abandoned. This application Apr. 11, 1984, Ser. No. 598,996

Int. Cl.[4] A01K 83/00

U.S. Cl. 43—43.16 12 Claims



1. An fishhook comprising a shank portion, an eyelet at one end of the shank portion, and a hook portion at the other end of the shank portion terminating in a point, a guard member comprising a wire having a first portion secured to said shank portion and having a hook member formed at the distal end of said first portion and positioned near said hook portion, said wire passing through said eyelet and being bent in a substantially U-shaped configuration and extending in a second portion substantially parallel to said shank portion and being engagable with said hook member, the distal end of said second portion being bent toward said point, whereby said second portion may be deflected away from said point when the hook is set in a fish and prevent a fish from being dislodged from said hook portion and may be released from said hook portion to facilitate release of a fish from said fishhook.

4,570,374

FLOATING FISH RECEPTACLE

Grover B. Baxley, 1901 Walnut Way, Noblesville, Ind. 46060

Filed Sep. 6, 1983, Ser. No. 529,600

Int. Cl.[4] A01K 97/04

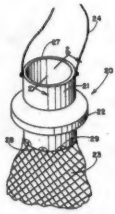
U.S. Cl. 43—55 14 Claims

1. A floating receptacle adapted to retain caught fish in a live condition under water, said floating receptacle comprising:

a housing member including an outer surface and an inner surface, and having two oppositely disposed, open ends, said inner surface defining an interior passageway between said open ends;

a floatation collar secured to the outer surface of said housing for retaining said receptacle in a generally upright condition with a first one of said open ends above the water level and the second and opposite open end submerged below the water level, said flotation collar extending radially outward from said housing member;

a fish-retaining member detachably secured to said housing member and enclosing said submerged end of said housing member; and



vertically spaced baffle members attached to the interior surface of said housing member and extending inwardly therefrom, said baffle members each having an innermost edge, said edges being spaced sufficiently from each other so as to permit the passage of a fish therethrough from said first open end through said passageway and out through said second open end into said fish-retaining member.

4,570,375

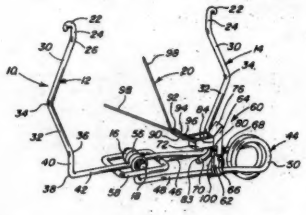
WILD GAME TRAP

Jerald K. Stroklund, R.R. 3, Minot, N. Dak. 58701

Filed Feb. 4, 1983, Ser. No. 463,927

Int. Cl.[4] A01M 23/26

U.S. Cl. 43—85 13 Claims

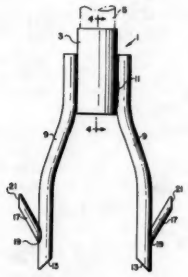


1. A wild game trap comprising a pair of multiangulated trap arms each mounted for rotation about pivot means, power spring means acting against said trap arms at points spaced from the pivot means to urge the trap arms toward animal gripping position, and trigger means extending between the trap arms and including an assembly engaging at least one of the trap arms to retain the trap arms in open, animal receiving, set position against the action of the spring means, said assembly being released from the trap arm in response to movement of the trigger means in multidirections, said spring means including a constriction bar means together with the pair of multiangulated trap arms cooperating in entrapment of the animal, each said trap arms also performing as a constriction bar means, each of the multiangulated trap arms including a straight segment defining a locking and power bar engaged by the spring means, a first portion applying initial force on an animal's back, a second portion continuing to apply force on the animal's back and adjacent sides as the trap arms cross over each other, said spring means providing efficient leverage on the locking and power bars of the multiangulated trap arms and forming one side of a five sided constriction area for the wild game animal trap.

4,570,376
SAFETY STUNNING TIP AND TRAP RETRIEVING HOOK AND METHOD OF USE THEREOF

Clarence A. Leggett, Rte. #1, Box 79, and Ronald L. Leggett, Rte. #1, Box 415, both of Boonsboro, Md. 21713

Filed May 15, 1984, Ser. No. 610,495
Int. Cl.[4] A01M *23/24*
U.S. Cl. 43—96 1 Claim



1. A combination stunning tip and trap retrieving hook comprising:

(a) a tubular member including means for receiving a handle therein,

(b) a pair of fork-shaped members attached to said tubular member and extending in a direction remote from said handle receiving means for restraining an animal, and

(c) at least one hook means attached to a fork-shaped member for retrieving a trap,

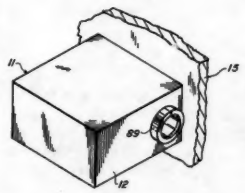
(d) said hook member being substantially rectilinear and angled at about 30° to said fork-shaped member, and

(e) said hook member having a pair of generally parallel ends beveled in relation to its rectilinear length, one end being attached to said fork-shaped member; and the other end providing a pointed end to facilitate retrieving a trap.

4,570,377
TAMPER-PROOF BAITING DEVICE FOR RODENTS AND THE LIKE

Russell R. Primavera, 5127 Alcott St., Denver, Colo. 80221

Filed Aug. 6, 1984, Ser. No. 638,235
Int. Cl.[3] A01M *1/20*
U.S. Cl. 43—131 15 Claims



1. A tamper-proof baiting device for delivering a poisonous feed to a rodent and the like without spillage of the feed comprising:

a housing including first and second sections interfitting in a closed position and adapted to be moved to an open position when unlocked;

a hopper in said housing in which a poisonous feed is contained, said hopper having a trough-like bin portion for holding the feed, said bin portion having opposed overhanging wall portions extending beyond said trough-like portion from opposite sidewalls to prevent said feed from spilling; and

a tubular entrance member extending through tube openings in said sections so as to hold said sections in the closed position, said tubular member having locking means for preventing it from being removed from said housing by children and the like and operable to permit said tubular member to be slidably removed from said housing and said sections to the open position to permit access to said hopper.

said tubular member having at least one end open and having at least one intermediate opening between the ends of the tubular member disposed within said housing forming a passageway to permit the entry of a rodent into and exit from said housing.

4,570,378
METHOD OF PROMOTING SEEDLING EMERGENCE OF FIELD-PLANTED, SMALL-SEEDED CROPS

Charles W. Wendt, Lubbock, Tex.; Joseph D. Shroder, Reedville, Va., and Michael D. Gerst, Lubbock, Tex., assignors to Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.

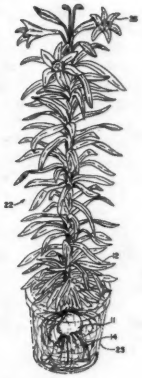
Filed Jul. 10, 1984, Ser. No. 629,508
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—9 6 Claims

1. The method of reducing soil surface strength and promoting the emergence of field-planted, small-seeded crops which comprises the steps of sowing seeds in an agricultural field; and applying an emulsion which includes a relatively water-soluble ammonium soap of an animal fat material to the soil directly over the sown seeds, said emulsion being applied at a rate of at least about 200 pounds of solids per acre.

4,570,379
LILY PROCESSES

James R. Oglevee; James F. Tammen, both of Connellsville, and Wendy O. O'Donovan, Scottdale, all of Pa., assignors to Oglevee Associates, Inc., Connellsville, Pa.

Filed Dec. 7, 1983, Ser. No. 559,035
Int. Cl.[4] A01C *1/00*; A01H *3/02*
U.S. Cl. 47—58 17 Claims



1. A method of growing a species of the genus Lilium comprising:

A. propagating from a substantially pathogen-free lily plant and in a growing media to form a bulblet;

B. growing the bulblet under conditions to prevent flowering and encourage foliage and root formation to form a young plant;

C. growing the young plant under conditions to prevent flowering and encourage foliage and root formation to form a plant having a large number of leaves rosette in form and an extensive root system;

D. growing said plant under conditions to initiate flowering and bolting; and

E. thereafter growing said plant to the desired plant condition.

4,570,380

ROUTE TO HYBRID COTTON PRODUCTION

Levon L. Ray, Lubbock, and Jose L. Longoria, Plainview, both of Tex., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,751

Int. Cl.[4] A01H *1/02*

U.S. Cl. 47—58 **28 Claims**

1. An improved process for the efficient production of seeds capable of growing F_1 hybrid cotton plants comprising:

(a) growing in a planting area a substantially random population of (i) broad-leafed male sterile cotton plants wherein the broad leaf configuration is attributable to a recessive gene pair for such characteristic and said male sterility is attributable to the combination of an atypical Cms cytoplasm and a recessive genetic system for male sterility, and (ii) narrow-leafed male fertile cotton plants wherein the narrow leaf configuration is attributable to a partially dominant gene pair for such characteristic and said male fertility is attributable to a dominant genetic system for fertility restoration;

(b) pollinating said substantially random population of cotton plants whereby cottonseeds are formed on said male sterile cotton plants (i) which are capable of growing male fertile F_1 hybrid cotton plants which possess a visually observable heterozygous leaf configuration that is intermediate in configuration between the leaf configurations of parent plants (i) and (ii), and cottonseeds are formed on said narrow-leafed male fertile cotton plants (ii) which are capable of growing narrow-leafed non-hybrid cotton plants;

(c) recovering cottonseeds which have formed on said substantially random population of cotton plants in said planting area;

(d) growing at least a portion of the cottonseeds recovered in step (c); and

(e) determining the approximate proportion of F_1 hybrid cottonseeds present in said cottonseeds recovered in said step (c) on the basis of the respective leaf shapes of said plants grown in step (d).

15. An improved process for the efficient production of seeds capable of growing F_1 hybrid cotton plants comprising:

(a) growing a substantially uniform first population of broad-leafed male sterile cotton plants wherein the broad leaf configuration is attributable to a recessive gene pair for such characteristic and said male sterility is attributable to a combination of an atypical Cms cytoplasm and a recessive genetic system for male sterility in pollinating proximity to a substantially uniform second population of narrow-leafed male fertile cotton plants wherein the narrow leaf configuration is attributable to a partially dominant gene pair for such characteristic and said male fertility is attributable to a dominant genetic system for fertility restoration;

(b) pollinating said broad-leafed male sterile cotton plants of said first population with pollen from said narrow-leafed male fertile cotton plants of said second population whereby cottonseeds are formed on said broad-leafed male sterile cotton plants of said first population which are capable of growing male fertile F_1 hybrid cotton plants which possess a visually observable heterozygous leaf configuration that is intermediate in configuration between the leaf configurations of the bulk of the plants of said first and second populations;

(c) recovering the cottonseeds which have formed on said plants of said first population;

(d) growing at least a portion of the cottonseeds recovered in step (c); and

(e) determining the approximate proportion of F_1 hybrid cottonseeds present in said cottonseeds recovered in said step (c) on the basis of the respective leaf shapes of the plants grown in step (d).

4,570,381

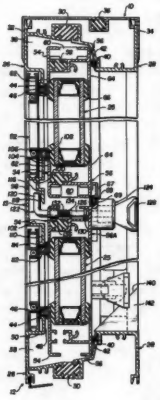
SINGLE PLANE WINDOW OR DOOR STRUCTURE

Maurice E. Sterner, Jr., Spring Grove, Pa., assignor to Product Design & Development, Inc., York, Pa.

Filed Apr. 19, 1984, Ser. No. 601,955

Int. Cl.[3] E05D *15/20*

U.S. Cl. 49—129 **13 Claims**



1. A door or a window structure for installation in an opening in an exterior wall of a building, comprising

an outer frame defining a rectangular opening, said frame including a pair of spaced parallel side frame members and a pair of spaced opposed end frame members, said side and end frame members being rigidly joined to define said rectangular opening,

a mullion extending between and having its ends rigidly joined one to each said side frame member at a point substantially equally spaced from each said end frame member, said mullion being disposed adjacent the outer surface of said frame when the frame is installed in an opening in the exterior wall of a building,

a pair of outer tracks extending one along each said side frame member in parallel opposed relation to one another,

a pair of inner tracks extending one along each said side frame member in parallel opposed relation to one another,

a first substantially rectangular panel mounted for sliding movement along said pair of outer tracks from a closed

position adjacent one of said end frame members to an open position spaced from said one end frame member,

a second substantially rectangular panel,

mounting means supporting said second panel for sliding along said pair of inner tracks from a closed position adjacent the other said end frame member to an open position spaced from said other end frame member, said mounting means including means supporting said second panel in substantially edge to edge coplanar relation with said first panel in said closed position and manually operable means to support said second panel in laterally spaced parallel relation to said first panel in the open position,

said mullion being spaced outwardly from and overlying adjacent edge portions of said first and second panels when said first and second panels are in said closed position,

locking means operable to releasably lock said first and second panels in said closed position, and

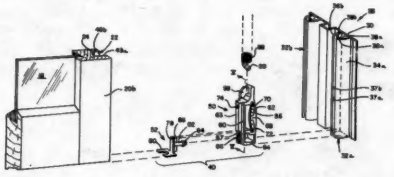
first seal means forming a weather-tight seal between said mullion and said first and said second panels when said first and second panels are in the closed position.

4,570,382

FRICTION BALANCE AND JAMB LINER FOR WINDOW SASH

Jack E. Suess, Wayland, Mich., assignor to Newell Mfg. Co., a Division of Citation-Walthers Co., Lowell, Mich.

Filed Dec. 27, 1983, Ser. No. 565,465
Int. Cl.[4] E05D *13/10*
U.S. Cl. 49—430 **16 Claims**



1. A slidable window assembly comprising:

a jamb;

a sash slidable within said jamb, said sash having a plow opening toward said jamb, said plow defined by a pair of sidewails and a concavely curved inner wall extending between said plow sidewalls;

a jamb liner having a body securable to said jamb and at least one channel extending outwardly from said body and into said plow, said channel including channel wall means extending laterally from said body, at least a portion of said channel wall means lying closely proximate and generally conforming to the shape of a portion of said concave inner plow bight wall, said channel further including friction shoe abutment wall means extending angularly from said channel wall means; and

a friction shoe slidably received within said channel and engaging said body and said shoe abutment means, said friction shoe including sash support means extending from said friction shoe for movably supporting said sash from said friction shoe during movement of said shoe in said channel.

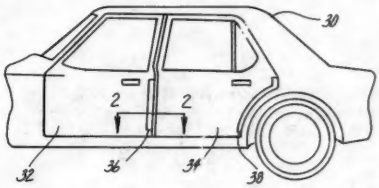
4,570,383

DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Sep. 19, 1983, Ser. No. 533,689
Int. Cl.[4] B60J *5/00*; E05F *7/00*
U.S. Cl. 49—462 **23 Claims**

1. In combination with the trailing edge of a swinging closure of a vehicle wherein the trailing edge is formed by wrapping an edge portion of an outer body panel around an edge portion of an inner body panel, and an edge guard of generally C-shaped cross section is installed on said trailing edge, said edge guard having inner and outer legs, the improvement which comprises said edge guard being a non-metallic material and mechanical means on said trailing edge for retaining said



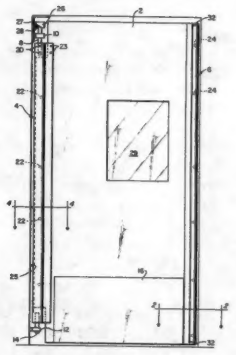
edge guard on said trailing edge, said mechanical means comprising enlargements formed in said outer body panel along said trailing edge on opposite sides thereof, and in which said edge guard fits over and around said enlargements with the edge guard's legs' distal ends being disposed beyond said enlargements and against opposite sides of said outer body panel along said trailing edge.

4,570,384

DOOR MOUNT AND DOOR NOSE

Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.

Continuation of Ser. No. 535,584, Sep. 26, 1983, abandoned. This application May 31, 1985, Ser. No. 740,237
Int. Cl.[4] E06B *3/00*
U.S. Cl. 49—501 **17 Claims**



1. A door assembly comprising:

a door panel having first and second longitudinally-extending edges at opposite sides thereof;

mounting means attached to said first longitudinally-extending edge for rotatably mounting said door panel to a door frame;

a door edge member attached to said second longitudinally-extending edge of said panel;

said door edge comprising a hollow straight tubular section having a split at a selected point, and first and second straight, parallel flanges formed integral with said hollow tubular section at said split;

said door edge member being slidably assembled to said panel so that said hollow tubular section surrounds said second longitudinally-extending edge of said panel and said flanges extend along opposite sides of said panel away from said second longitudinally-extending edge; and

a plurality of hollow-roll pins attached to said panel adjacent

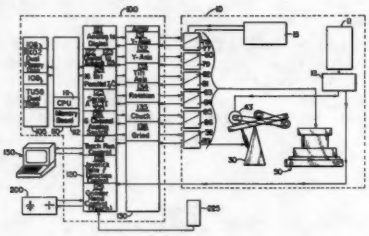
said second edge, said pins extending transversely within said hollow tubular section of said door edge member perpendicularly to said panel, said pins having a length which is substantially equal to the maximum internal dimension of said hollow tubular section in a plane extending at a right angle to the plane of said door panel so as to prevent movement of said door edge member in a lateral direction relative to said panel.

4,570,385

COMPUTER CONTROLLED WORKPIECE FINISHING APPARATUS

John M. Richter, Pittsburgh, and James G. Bair, Jr., Wexford, both of Pa., assignors to Fox Grinders, Inc., Harmony, Pa.

Filed Jun. 27, 1983, Ser. No. 507,766
Int. Cl.[3] B24B *49/00*
U.S. Cl. 51—165.71 8 Claims



1. In a metal removing system comprising a workpiece holder and a power-operated rotatable metal-removing tool mounted for movement against each other by positioning means, means connected with said positioning means generating signals indicative of successive positions of said tool and said holder with respect to each other, and memory means for storing control signal for said positioning means, the improvement comprising operator-directed means connected with said positioning means for causing said workpiece holder and said tool to trace a three dimensional path for said tool over a three dimensional workpiece pattern, operator-directed means for storing in said memoroy said signals generated at said successive positions in said path, and operator-directed means for automatically retrieving said signals from said memory and applying them to said positioning means so as to cause said tool to remove metal from a workpiece along said path, whereby successive three-dimensional workpieces can be machined to the countour of said workpiece pattern.

4,570,386

REGULATING WHEEL DRESSING SYSTEM IN CENTERLESS GRINDER

Kunihiko Unno; Toshio Tsujiuchi, both of Kariya, and Yasuo Niino, Gamagohri, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 25, 1984, Ser. No. 614,151
Claims priority, application Japan, Jun. 8, 1983, 58-102294
Int. Cl.[4] B24B *49/18*
U.S. Cl. 51—165.71 3 Claims

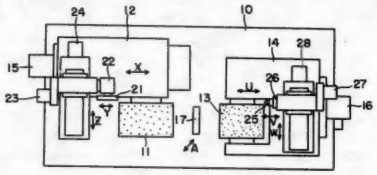
1. A dressing system for dressing a regulating wheel to the shape of a hyperboloid of one sheet of revolution in a centerless grinder of the type wherein a workpiece to be ground by a grinding wheel is rotatably supported by a regulating wheel and a work blade and the rotational axis of said regulating wheel is inclined at a predetermined angle relative to the axis of said workpiece in a plane parallel to the axis of said workpiece, said dressing system comprising:

a dressing tool mounted on said centerless grinder for movement in a first direction parallel to the axis of said regulating wheel and in a second direction transverse to said first direction;

first and second feed means for respectively moving said dressing tool in said first and second directions;

memory means for storing various data including a throat circle diameter of said hyperboloid of one sheet of revolution, said predetermined angle, a finish diameter of said workpiece, a center height of said workpiece and a dressing tool position in said first direction relative to said regulating wheel;

calculation means for successively calculating based upon said various data being stored in said memory means a



plurality of positions to which said dressing tool is to be successively moved for dressing said regulating wheel to said hyperboloid of one sheet of revolution;

feed control means for controlling said first and second feed means to operate simultaneously so as to move said dressing tool along said plurality of positions calculated by said calculation means; and

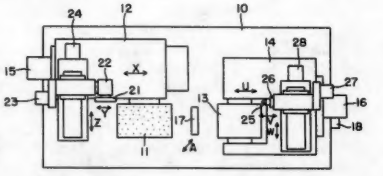
first data rewriting means for rewriting prior to the operation of said calculation means said throat circle diameter being stored in said memory means so that the rewritten throat circle diameter represents an actual throat circle diameter which said regulating wheel after a dressing operation would have.

4,570,387

CENTERLESS GRINDING MACHINE

Kunihiko Unno; Toshio Tsujiuchi, both of Kariya, and Norio Ohta, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 4, 1984, Ser. No. 607,213
Claims priority, application Japan, May 27, 1983, 58-94285
Int. Cl.[4] B24B *49/04*
U.S. Cl. 51—165.71 3 Claims



1. In a centerless grinding machine having first and second supports mounted on a bed and respectively rotatably carrying a grinding wheel and a regulating wheel, a work blade mounted on said bed between said grinding and regulating wheels for rotatably supporting a workpiece in cooperation with said regulating wheel during a machining operation of said workpiece, a first feed device for moving said work blade in a direction transverse to a first line extending across the axes of said grinding and regulating wheels, and first and second dressing means for respectively dressing said grinding and regulating wheels, the improvement comprising:

a data memory for storing diameters of said grinding and regulating wheels, a desired finish diameter of said workpiece and a predetermined value representing the sine of a

center height angle, said center height angle amounting to the sum of angles which a second line extending across the axes of said grinding wheel and said workpiece and a third line extending across the axes of said regulating wheel and said workpiece respectively make relative to said first line when said workpiece is finished to said desired finish diameter;

data rewriting means for rewriting said grinding and regulating wheel diameters being stored in said data memory respective when said grinding wheel and said regulating wheel are dressed by said first and second dressing means, so as to make the rewritten diameter data respectively represent the actual diameters of said grinding and regulating wheels;

first calculation means for calculating a center height based upon said grinding and regulating wheel diameters, said desired finish diameter and said predetermined value being stored in said data memory, said center height defining a position at which the axis of said workpiece with said desired finish diameter is to be located for maintaining said center height angle constant independently of decreases in diameters of said grinding and regulating wheels; and

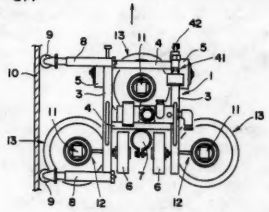
first feed control means connected to said first feed device for controlling the same based upon said calculated center height so that said center height angle is maintained constant.

4,570,388

APPARATUS FOR ABRASIVE CLEANING

Hiroshi Tano; Masanobu Takahashi, both of Maizuru; Minoru Shiraishi; Yoshimi Numata, both of Kumamoto; Norio Urata, Arao; Tatsuo Kawano, Kumamoto, and Tatsumi Onaka, Amagasaki, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jan. 9, 1984, Ser. No. 569,312
Int. Cl.[3] B24B *7/10;* **B63B** *59/10*
U.S. Cl. 51—177 **10 Claims**



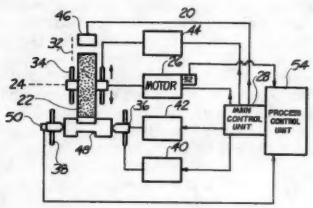
1. An apparatus for abrasive cleaning comprising a truck adapted to run on the surface to be cleaned and at least one abrasive cleaner supported by supporting means on the truck and limitedly movable toward or away from the surface, the abrasive cleaner having an abrasive cleaning tool at its lower end, said or each abrasive cleaner being supported by the supporting means so as to be limitedly tiltable in every direction with respect to an axis approximately perpendicular to the surface, the supporting means being provided with resilient means for biasing the abrasive cleaner away from the surface, said or each abrasive cleaner being provided with a fluid drive motor for rotating the abrasive cleaning tool, the drive motor being connected to a working fluid supply source by way of a pilot valve openable or closable by a change-over valve, the pilot valve having a vlave casing, an L-shaped flow channel formed within the valve casing, a valve seat formed at an intermediate portion of the flow channel, a plunger enclosed in and guidable by a plunger chamber formed within the valve casing, the plunger being provided with first pressure receiving surface means positioned within the flow channel in opposed relation to the valve seat and with second pressure receiving surface means positioned within the plunger chamber and having a larger effective pressure receiving area than the first pressure receiving surface means, an inlet formed in the valve casing and communicating with the flow channel at a location upstream from the valve seat and with the working fluid supply source, a control outlet formed in the valve casing and communicating with the flow channel at a location downstream from the valve seat, the control outlet being adapted to communicate with the plunger chamber through the change-over valve when the change-over valve is in its open state, and a supply outlet formed in the valve casing and communicating with the flow channel at a location downstream from the valve seat and with the fluid drive motor of said or each abrasive cleaner.

4,570,389

METHOD OF ADAPTIVE GRINDING

Paul A. Leitch, Northfield; Robert C. Chang, and Randy E. Thompson, both of Twinsburg, all of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Jan. 30, 1984, Ser. No. 575,084
Int. Cl.[4] B24B *49/16*
U.S. Cl. 51—325 **17 Claims**



1. A method of grinding the surface of workpieces by a grinding machine having a grinding wheel which exhibits a characteristic of attrition in which the grinding wheel dulls with continued grinding or a characteristic of self-sharpening in which the grinding wheel sharpens with continued operation, said grinding wheel sharpness being detectable by measuring the value of process parameters correlatable with grinding wheel sharpness, said grinding wheel having neither characteristic at a predetermined level of controlled operating parameters, comprising the steps of:

(a) conditioning the surface of the grinding wheel to establish a desired level of wheel sharpness,

(b) grinding for a first interval at a determinable level of said controlled operating parameters,

(c) measuring and storing the value of a first process parameter correlatable with grinding wheel sharpness generated during the first interval,

(d) grinding for a second interval at the determinable level of the said controlled operating parameters,

(e) measuring and storing the value of the first process parameter generated during the second interval,

(f) comparing the stored values of the first process parameter generated during the respective first and second intervals to generate control signals corresponding respectively to either an increase in grinding wheel dullness or sharpness,

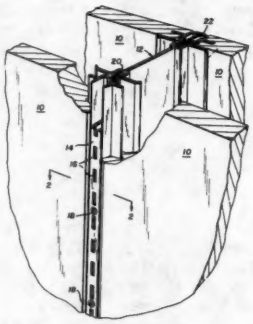
(g) adjusting the level of said controlled operating parameters in response to generation of either of said control signals so as to eliminate either of said grinding wheel characteristics and to maintain the sharpness of the grinding wheel at the desired level.

4,570,390

PARTITION SYSTEM ADAPTED TO SUPPORT A CANTILEVERED LOAD

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Nov. 14, 1983, Ser. No. 551,424
Int. Cl.[3] E04B *2/00*
U.S. Cl. 52—36 **10 Claims**



1. A wallboard partition which comprises:

an upright metal stud comprising a longitudinal web having a central plate portion and a consecutively furcated portion, and a pair of flanges extending laterally from the furcated portion and away from each other; the furcated portion defining a longitudinal, two-tiered channel, the first tier being proximate to the plate and having confronting facets adapted to engage the threads of a screw, the second tier being wider than the first and having an unobstructed mouth distal to the plate; and

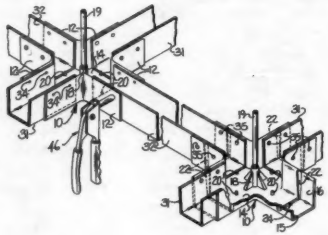
a wallboard panel having a front side, a back side and an edge between said sides, said edge having a kerf into which a stud flange extends.

4,570,391

CONNECTOR FOR A FILTER BANK SUPPORTING FRAMEWORK AND METHOD OF ASSEMBLING SAME

M. John Quante, and Terry W. Cutler, both of Washington, N.C., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Dec. 20, 1982, Ser. No. 451,198
Int. Cl.[4] G09F *7/18*; E04B *5/52*
U.S. Cl. 52—39 **10 Claims**



1. A method of assembling a supporting latticework which defines a length and width direction, a plurality of rectangular open areas, and a bounding perimeter, and which is adapted for supporting a filter and the like within each of said open areas, and characterized by the length and width dimensions of the rectangular open areas being readily established within given design tolerances, and comprising the steps of

providing a plurality of generally X-shaped connectors, with each connector including four U-shaped extensions radiating from a common central location at right angles to each other, a coupling member disposed at said central location, and protuberance means disposed on each of said U-shaped extensions at a predetermined distance from said coupling member,

suspending each of the connectors from an overhead support, and including interconnecting a tie rod with the coupling member of each connector, and with the connectors being disposed at the corners of the intended rectangular open areas in the interior of the latticework,

providing a plurality of additional connectors each having a plurality of U-shaped extensions radiating from a central location at right angles to each other, and protuberance means fixedly disposed on each of said U-shaped extensions at a predetermined distance from said central location thereof,

mounting each of said additional connectors so as to be disposed at the corners of the intended rectangular open areas about the perimeter of the latticework and with each extension of the additional connectors being aligned with an extension of one of the X-shaped connectors or another of the additional connectors,

providing a first set of U-shaped channels each having a common predetermined length, and a second set of U-shaped channels each having a common predetermined length, and with the length of each of the first set of channels being substantially equal to the distance between the protuberance means of the aligned extensions of adjacent connectors along the length direction of the latticework when the connectors are spaced the designed distance in the length direction, and with the length of each of the second set of channels being substantially equal to the distance between the protuberance means of the aligned extensions of adjacent connectors along the width direction of the latticework when the connectors are spaced the designed distance in the width direction,

placing one of the first set of channels between each adjacent pair of connectors along the length direction, with the ends of the channels being received in respective extensions of the connectors and abutting the protuberance means thereof,

placing one of the second set of channels between each adjacent pair of connectors along the width direction, with the ends of the channels being received in respective extensions of the connectors and abutting the protuberance means thereof, and

securing each of the channels to each associated connector.

4,570,392

STOREHOUSE CONSTRUCTION

John P. Oltman, Cedar Falls; Steven J. Kreger, Waterloo, and Richard D. Purchase, Cedar Falls, all of Iowa, assignors to Waterloo Industries, Inc., Waterloo, Iowa

Filed Nov. 23, 1984, Ser. No. 674,245
Int. Cl.[4] E04B *7/16*
U.S. Cl. 52—64 **2 Claims**

1. An improved knock down shed construction comprising, in combination:

opposite the side walls and a back wall for forming a three sided enclosure, said side walls and back wall being substantially rectangular in shape, said opposite side walls being substantially identical in shape;

a pair of vertically hinged doors forming a portion of the front wall, each of said vertically hinged doors being attached respectively to one of the side walls;

gambrel gable extensions from the top of each side wall, said gable extensions having a double pitch;

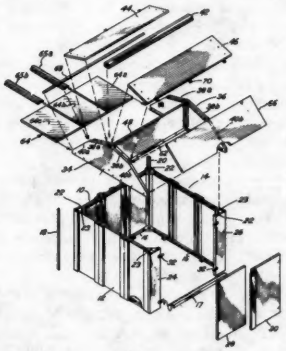
a roof ridge cap;

four roof panels, two of which are upper roof panels and are permanently attachable to the gable extensions, said upper roof panels extending in a direction between the side walls at the peak of the shed and further cooperative with the

rood ridge cap, the other two remaining roof panels being lower roof panels, each lower roof panel being attachable to one of the upper roof panels, respectively, by hinge means to open outward and upward;

a vertical center line wall panel;

said roof ridge cap comprising an integrally formed longitudinal member having a length greater than the side wall spacing, oppositely disposed inclined slots at an angle equal to the upper gable of the roof, one of said slots adapted to receive one upper roof panel, said cap also



including a depending center slot for receipt of the vertical wall panel depending from the roof ridge cap;

a horizontal shelf panel attachable between the top of the side walls and extending from the back wall to the vertical wall panel depending from the roof ridge cap; and

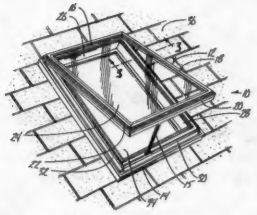
means for fastening the panels, doors and ridge cap together to form the shed, whereby upon assembly of the shed, the front doors and the front, lower roof panel may be opened to permit entry to a main chamber of the shed, and the rear lower roof panel may be opened to permit entry to a horizontal storage shelf at the back side of the shed.

4,570,393

WEATHER SEAL FOR FRAME AND MOVABLE PANEL ASSEMBLY

Mearl Minter, Oshaloosa, Iowa, assignor to Rolscreen Company, Pella, Iowa

Filed Jan. 6, 1983, Ser. No. 456,256
Int. Cl.⁴ E04F *19/00*
U.S. Cl. 52—72 **11 Claims**



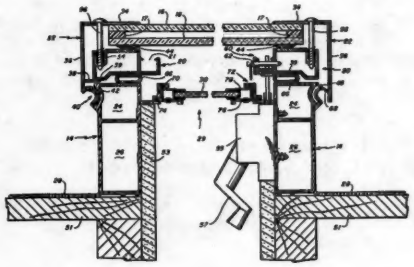
1. An improved weatherstripping assembly for use with a perimeter frame and a panel pivotally mounted to said frame and adapted to open from and close against said frame, said panel having a perimeter edge, said assembly comprising: a first flange extending upwardly from said frame; a second flange extending downwardly from said panel and being spaced apart from the perimeter edge of said panel to define a recessed area adjacent said edge of said panel; a first weatherstripping member operatively associated with said recessed area and said first flange; said first flange being adapted to enter said recessed area with said first weatherstripping member providing substantially air-tight sealing engagement between said panel and said frame upon closure of said panel against said frame; a second weatherstripping member operatively associated with said first flange and said second flange, said second weatherstripping member providing upon closure of said panel against said frame a non-air-tight substantially watertight seal between said panel and said frame; said second weatherstripping being spaced outwardly on said frame with respect to said first weatherstripping member so as to define an air space between said first and second weatherstripping member and being constructed of such flexible material so as to permit the air pressure to equalize on both sides of said second weatherstripping member when said panel is closed against said frame and whereby said second weatherstripping member functions as a water screen to protect said first weatherstripping member from moisture.

4,570,394

VENTILATING SKYLIGHT

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Continuation of Ser. No. 341,773, Jan. 22, 1982. This application Feb. 6, 1984, Ser. No. 577,557
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.⁴ E04B *1/346*
U.S. Cl. 52—72 **14 Claims**



1. A skylight construction for an opening in a building or the like comprising;

a frame means extending about the opening and including means secureable about the opening,

translucent or transparent means covering the opening and extending at edges to overlie the frame means,

means for retaining the covering means on the frame means,

said frame means having at least said base frame comprised of a rigid plastic core, and a plastic capping material extruded over the external exposed surface of the core to protect the core from weathering,

said base frame having at least one flexible gasket integrally formed with said plastic core and being less rigid than the plastic core,

said integral flexible gasket comprising a gasket extending from and integral with a wall of the base frame and disposed sandwiched between the base frame and overlying support frame,

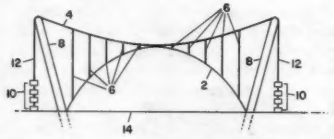
said plastic capping material being substantially thinner than the thickness of the base frame, covering exposed portions of the rigid plastic core and terminating so that the gasket is absent a covering of the capping material whereby the gasket maintains its flexibility.

4,570,395

EARTHQUAKE RESISTANT SELF-BALANCING DOME STRUCTURE

John P. Zima, 25058 N. Chestnut St., Newhall, Calif. 91321

Filed Nov. 21, 1983, Ser. No. 553,699
Int. Cl.[4] E04B 7/14
U.S. Cl. 52—83 10 Claims



1. An earthquake resistant self-balancing dome structure comprising:

a flexible light weight dome;

a plurality of supports spaced around said dome;

a plurality of cable means extending over said supports, each having at least one outer end located at a point on said cable means away from said dome, at least one outer portion located in a region of said cable means immediately inward of and adjacent to said outer end, and at least one inner portion located in a region of said cable means inward of said outer portion and being secured to said dome to support it;

said cable means being free to make limited controlled movement over said supports;

a plurality of weights secured to the outer ends of each of said cable means; and

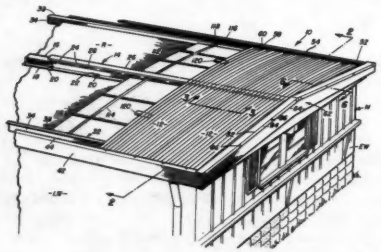
means for supporting said weights on said cable means with at least one of said weights engaging a rest means for said one weight, and others of said weights being located close to rests whereby movements of the outer portion of said cable means in one direction or the other will increase or decrease tension on said cable means.

4,570,396

ROOF STRUCTURE FOR MOBILE HOMES

Francis L. Struben, 3870 Jarrettsville Pike, Jarrettsville, Md. 21062

Filed Nov. 9, 1983, Ser. No. 550,089
Int. Cl.[3] E04B 7/02
U.S. Cl. 52—90 10 Claims



1. A roof structure for a mobile-type home having an existing roof, comprising:

a center support means, said center support means being a longitudinal support, said center support means consisting of a main body member, a stringer member, a plurality of spacer members, and a plurality of connection members, said main body member having a configuration that is hat-like in cross section, said hat-like configuration being composed of a channel-like portion and two outstanding flange legs, said outstanding flange legs each being a right angle continuation of the longitudinal edge of the each of the flanges of said channel-like portion, said stringer member paralleling the longitudinal length of the web of said channel-like portion, said plurality of spacer members being spaced apart along said web of said channel-like portion and interfacing therewith and between said web and said stringer member with which said plurality of spacer members also interfaces, thereby spacing said stringer member from said web and thereby creating a space for air flow between adjacent said spacer members and between said web and said stringer member, said main body member, said plurality of spacer members, and said stringer member being suitably affixed to each other, said plurality of connection members being strap-like with the ends thereof bent into a clip-like configuration, said clip-like configuration at each end of said strap-like connection member being slidably and removably affixed around said two outstanding flange legs, said plurality of connection members being the means whereby said center support means is suitably affixed to said existing roof of said mobile-type home;

a pair of soffit support means, each of said pair of soffit support means being spaced one to the right and one to the left, respectively, from said center support means, said pair of soffit support means being longitudinal supports, said pair of soffit support means being set at a lower elevation than said center support means;

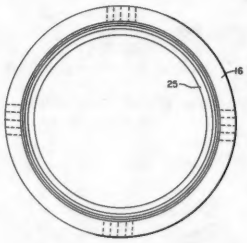
a plurality of roof panels, each of said plurality of roof panels being located adjacent to each other and having their side edges partially overlapping with the next adjacent roof panel, each of said plurality of roof panels being longitudinally curved in a configuration so as to fit the topmost elevation of said center support means and each of said pair of soffit support means, said plurality of roof panels being suitably affixed to said center support means and to each of said pair of soffit support means.

4,570,397

ADJUSTABLE PEDESTAL

Edward J. Creske, P.O. Box 1520, Wausau, Wis. 54401

Filed Feb. 22, 1984, Ser. No. 582,258
Int. Cl.[4] E04B 5/58
U.S. Cl. 52—126.6 5 Claims



1. A pedestal comprising a plurality of similar substantially annular members telescoping one within the other and each having a wall tapering from the bottom to the top, with the walls being in contact with the next adjacent wall, and locking means associated with each wall for locking one wall to the other in an extended position, said locking means being formed in a portion of the wall by distorting the roundness of the same;

wherein the lowermost member is provided with a base for supporting the remaining annular members;

wherein each member has a flange extending outwardly from the top thereof to prevent one member from totally sliding within its next adjacent member while providing a finger grasping surface to facilitate the extending and the angular disposition of each of the same; and placing concrete in said annular member and

wherein a support member positioned on the topmost annu-

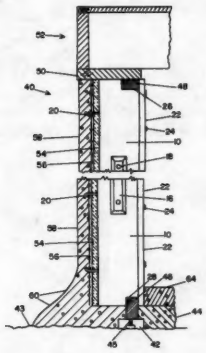
lar member is provided with upstanding equidistantly spaced ribs whereby a corner of a tile can be disposed between adjacent ribs.

4,570,398

SPRAYED CONCRETE BASEMENT STRUCTURE

Melvin M. Zimmerman, Blue Ball, Pa., assignor to Superior Walls, East Earl, Pa.

Filed Mar. 2, 1984, Ser. No. 585,410
Int. Cl.⁴ E02D *19/00*
U.S. Cl. 52—169.11 **28 Claims**



1. A wall structure comprising:

a base beam located in essentially a horizontal plane and sitting upon an underlying support for the wall;

concrete studs, their lengths oriented vertically and their bottom ends attached to and spaced along the base beam, each concrete stud including a strip attached to its edge which is on the inside surface of the wall structure and fasteners attached to the edge which is on the outside surface of the wall structure;

a top plate, attached to the top ends of the concrete studs, located in an essentially horizontal plane;

insulation attached to the outside edge of the concrete studs by the fasteners attached to the outside edges of the concrete studs;

reinforcement means located on the outside surface of the insulation and attached to the insulation and the concrete studs by the fasteners attached to the outside edges of the concrete studs; and

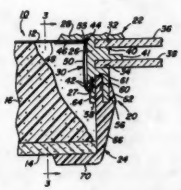
a layer of concrete attached to the surface formed by the reinforcement means and the insulation, the concrete enclosing the reinforcement means and the insulation.

4,570,399

PANEL LITE INSERT SYSTEM

James T. Wentink, Wheaton, Ill.

Filed May 30, 1984, Ser. No. 615,228
Int. Cl.⁴ E06B *3/00*
U.S. Cl. 52—208 **7 Claims**



1. A lite insert system for a panel, said panel comprising a first surface member having outer and inner sides, said system comprising:

a first frame for insertion into an opening in said panel,

said frame including a body portion and a peripheral flange extending therefrom, said flange adapted for disposition against the outer side of said surface member around said opening, said body portion having a groove spaced from said flange and extending inwardly of the body portion in a direction generally toward said flange, said groove defining a wall internal to said body portion;

a glaze pane mounted in said frame; and

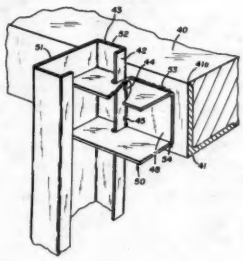
a plurality of clips positioned around said opening, said clips each including a first leg portion for abutment against the inner side of said surface member, a second leg portion extending from an end of said first leg portion, and a third leg portion extending from an end of said second leg portion, said third leg portion adapted to be received within the groove of said body portion and to grip said wall of the groove, whereby said first leg portion is retained in abutment against the inner side of said surface member and said frame is retained within said opening of said panel.

4,570,400

CURTAIN WALL STUD SLIDE CLIP

Richard E. Slager, Prospect Heights, and Henry A. Balinski, Hoffman Est., both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 12, 1983, Ser. No. 560,110
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—235 **2 Claims**



1. A slide clip adapted for connecting a curtain wall stud, the stud having a web, a flange perpendicular to the web, and a return lip perpendicular to the flange, to the load bearing framework of a building, said clip comprising a strut, a pair of congruent fins integral with, spaced apart by, and extending laterally from the strut, said strut having a slot therein which extends into each of the fins, each fin having a notch therein which is a continuation of said slot, and a pair of convergent strips cut from but integral with the strut which protrude into the slot to form a clamp adapted to frictionally engage the lip of the stud, said clamp being sufficient to support the weight of the clip but insufficient to resist a vertical force applied to the clip.

4,570,401
DEVICE FOR ADJUSTABLY MOUNTING FACING PLATES

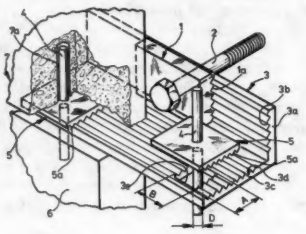
Philipp Uebel, Prien; Jaroslav Rousek, and Raimer Uhlig, both of Munich, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan Fürstentum, Liechtenstein

Filed Sep. 19, 1984, Ser. No. 652,455

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333954

Int. Cl.⁴ E04G *21/00, 23/00*

U.S. Cl. 52—235 **8 Claims**



1. A mounting device for adjustably mounting facing plates and similar members on a structure including an abutment arranged to be anchored to the structure, said abutment having a first surface facing the structure and an oppositely directed second surface, an elongated supporting member having an L-shaped cross-section transverse to the elongated direction thereof, the L-shaped cross-section of said supporting member comprises a first leg and a second leg extending approximately perpendicularly of said first leg, said legs extending in the long direction of said supporting member and each having a first surface and a second surface facing in opposite directions, said abutment and said first leg of said support member arranged to be positioned in contacting engagement, first means formed on the contacting surfaces of said abutment and said first leg for affording meshed interengagement therebetween, at least one supporting bolt arranged to extend into a receiving bore in one of the facing plates, said supporting bolt arranged to extend perpendicularly to said second leg of said supporting member and to project outwardly from said second leg, wherein the improvement comprises second means formed on one of said first and second surfaces of said second leg for effecting a meshed interengagement, and a supporting plate having a first surface and a second surface with said at least one supporting bolt connected to and extending outwardly from at least one of the first and second surfaces of said supporting plate, one of said first and second surfaces of said supporting plate arranged to contact the one of said first and second surfaces of said second leg on which said second means are formed, and third means formed on the one of said first and second surfaces of said supporting plate for effecting meshed interengagement with said second means.

4,570,402
CONNECTOR APPARATUS FOR MODULAR PANEL STRUCTURE

Bernard L. Johnson, Danville, Calif., assignor to Universal Building Systems, Inc., San Jose, Calif.

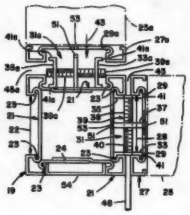
Filed May 23, 1983, Ser. No. 496,966

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—241 **3 Claims**

1. In a modular panel system including a panel; a structural member; a connector assembly coupling said panel to said structural member; and a support bracket having hook-like feet coupled to said connector assembly for support of a load therefrom; said panel and said structural member each including groove defining means, said groove defining means providing a groove extending along an edge of each of said panel and said structural member having an open groove portion extending inwardly and two transverse groove portions extending laterally from opposite side walls of said open groove portion, said connector assembly including first and second C-shaped channels disposed between said panel and said structural member in back-to-back relation, said channels each having two flanges disposed at substantially right angles to a connecting web, said flanges on one end of each of said channels engaging said transverse groove portions of said panel on opposite sides of said open groove portion, and said flanges on the other end of each of said channels engaging corresponding sides of said transverse groove portions of said structural member, said connector assembly also including a threaded element mounted to one of said channels, wherein the improvement in said modular panel system comprises:

said threaded element is disposed between said first and second C-shaped channels, the web of said first channel being threadedly engaged to a right-hand thread portion of said threaded element and the web of said second channel being threadedly engaged to a left-hand thread portion



of said threaded element to hold said first channel, said second channel and said threaded element together as a manipulatable unit, said threaded element being operable from either side of said connector assembly for changing the distance between said channels upon rotation of said threaded element, and a longitudinally extending U-shaped member secured to the other side of each of the webs of said first channel and second C-shaped channels, said U-shaped member having a plurality of slots closely spaced along the length thereof and receiving said hook-like feet of said support bracket therein to load said webs in a direction urging said flanges into said grooves, said threaded element being dimensioned to be substantially flush with the outer surface of said webs when said flanges are fully interengaged with said grooves, and said webs having a thickness dimension along said threaded element allowing full disengagement of said flanges from said groove for removal of said connector assembly as a unit from said panel structure.

4,570,403
FOUNDATIONS ANCHOR FOR A MODULAR BUILDING

Timothy J. Dannemiller, Carroll, Ohio, assignor to Cardinal Industries, Inc., Columbus, Ohio

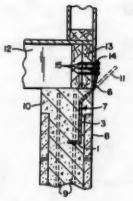
Filed Oct. 27, 1983, Ser. No. 545,830

Int. Cl.⁴ E04B *1/41;* **E04C** *5/16*

U.S. Cl. 52—295 **1 Claim**

1. In a device anchoring a prefabricated building to a concrete foundation wall and which includes an integral, elongated sheet metal strap formed with a base flange having an opening therein receiving a generally vertically disposed, foundation-reinforcing bar, an intermediate body section integrally joined with and disposed in substantially perpendicular relation to said base flange, said base flange and intermediate body section being embedded in a concrete foundation wall; that improvement which comprises a relatively wider upper plate section integrally joined with and normally disposed in obtuse angular relation to said intermediate body section, said plate section being formed with an included, transversely

disposed slot defining a weakened, bendable intermediate portion in said plate section and a plurality of nail-receiving openings disposed outwardly from said slot; the slot and nail-receiving openings of said plate section being arranged to extend



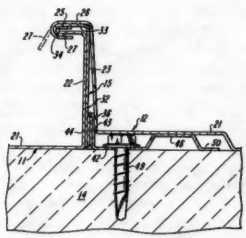
upwardly and outwardly from a foundation wall in which the base flange and intermediate body sections of said strap are embedded and for nailed connection with the base portion of a building set on such foundation wall.

4,570,404

TWO-PART HOLD-DOWN APPARATUS WITH SLIP JOINT FOR SEAMED PANEL ASSEMBLIES

Gary A. Knudson, 17356 West 57th Ave., Golden, Colo. 80401

Filed Mar. 7, 1983, Ser. No. 472,586
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—520 **11 Claims**



1. Hold-down apparatus for securing a panel assembly, including first and second side by side panels having adjacent sidewall portions joined by a seam, to a supporting structure while allowing relative longitudinal movement of said panel assembly relative to said supporting structure in response to forces produced by the thermal expansion and contraction of said panel assembly, said hold-down apparatus comprising:

a first fastening member including an upstanding web portion, a top flange portion extending laterally of an inner face of the web portion facing a first panel and firmly secured to the seam, the web portion extending down to substantially a supporting surface, and a pocket portion connected at the bottom of said web portion and extending upwardly along an outer face of said web portion for a portion of the vertical extent of said web portion, said pocket portion having a top rim; and

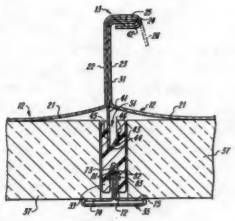
a second fastening member including a depending end section slidable along said pocket portion, a top section cupped over and bearing against said top rim to apply hold-down forces thereto, a leg opposite said end section forming a relatively deep inverted channel to form a slip joint with said pocket portion, said pocket portion and inverted channel being similar in size and shape, and a base extending laterally away from said inverted channel and from said first panel, said base being affixed to said supporting surface, said base being covered by a second panel, said second panel having an outturned flange at the upper end of an associated sidewall portion overlying said top flange portion, said outturned flange having a terminal section bent under an inturned flange at the upper end of an associated sidewall portion of said first panel to seam in and thereby firmly secure said top flange portion between said inturned and outturned flanges.

4,570,405

INSULATING APPARATUS DGK FOR PANEL ASSEMBLIES

Gary A. Knudson, 17356 W. 57th Ave, Golden, Colo. 80401

Filed Sep. 30, 1982, Ser. No. 431,757
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—521 **14 Claims**



1. In insulating apparatus for a panel assembly including a plurality of side by side panels, adjacent panels having adjacent edge portions joined at seams, the combination comprising:

rows of spaced anchor clips secured in selected of said seams, each anchor clip extending inwardly from said seams and having a first resilient male snap fastening member in the form of a flexible hook portion with a bend at the lower end and having an inclined return portion which extends back and away from a shank portion at an angle, said return portion having a transverse edge;

an intermediate connecting member having a first female retaining groove for slidably receiving a first male snap fastening member on an associated anchor clip, said retaining groove having a neck narrower than the width of said hook portion through which said hook portion passes and is contracted upon insertion into said retaining groove and a lateral shoulder inwardly of said neck, said hook portion expanding after said transverse edge is inserted past said lateral shoulder to lock said hook portion from being pulled from said retaining groove, whereby each connecting member is readily hand-fastened to the associated anchor clip after said anchor clip is secured in the associatedseam, said intermediate connecting member having a second female retaining groove; and

retaining means including laterally inwardly extending support portions on which a body of insulation is supported along the inside of the panel assembly between said rows of anchor members, said retaining means having a second resilient male snap fastening member slidably received by an associated second female retaining groove of an intermediate connecting member and extending along a row of said intermediate connecting members, whereby said retaining member is readily hand-fastened to said connecting member after said connecting member is in place on an associated anchor clip.

4,570,406

SCREEN FRAME CORNER CONNECTOR KEY

Joseph DiFazio, Troy, Mich., assignor to Acorn Building Components, Inc., Detroit, Mich.

Filed Dec. 12, 1983, Ser. No. 560,566
Int. Cl.[3] E04C *2/38*
U.S. Cl. 52—656 **1 Claim**

1. In a screen frame corner construction formed of a pair of elongated, thin wall, open-ended tubular frame members ar-

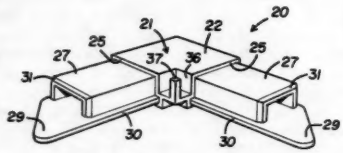
ranged at right angles to each other, with a corner connector key arranged between and having perpendicularly arranged integral legs that are telescopically fitted within adjacent member end portions, the improvement comprising:

the transverse cross-sectional shape of each frame member being substantially uniform along a full length of said member and including a generally rectangular tubular portion defined by exterior and interior dimensions, a generally U-shaped groove for receiving the peripheral edge of screening material to be assembled to the screen frame, and a pocket opening into and forming an extension along one side of the interior of said rectangular porton;

said corner connector key comprising a corner portion at the intersection of said integral legs, the exterior transverse cross-sectional shape of said corner portion being shaped and dimensioned to be the same as that of the exterior of said rectangular tubular portion of said frame members;

the exterior cross-sectional shape of said integral legs being shaped and dimensioned to be substantially the same as said interior dimensions of said frame member rectangular tubular portion so as to be snugly but slidably insertable therein in telescoping fashion.

said corner connector key having circumferential shoulders located where larger exterior dimensions of said corner



portion meet smaller exterior dimensions of said integral legs, said shoulders defining a positive stop for the ends of said frame members which limits the insertion length of said integral legs into said frame members;

each of said integral legs further having a flange extending continuously along one longitudinal side thereof, said flange being dimensioned and positioned to be snugly telescopically received within said pocket of said frame member when said leg is inserted therein, and said flange also extending longitudinally beyond the end of said leg remote from said corner portion to form a guide to assist in aligning said leg with said frame member during insertion;

and said corner connector key further having a post aligned with said shoulders but spaced therefrom to define therebetween a pair of perpendicularly intersecting grooves which are aligned with said U-shaped grooves of said frame members, whereby a continuous groove is formed around the full periphery of an assembled screen frame, said post also functioning as an abutment for both fully inserted frame member;

whereby the snug fit of said corner connector key legs within said frame members, coupled with the abutment of the ends of said frame members against said shoulders and said post rigidifies the assembled screen frame.

4,570,407

TRUSS ASSEMBLY AND ATTACHMENT MEMBER FOR USE WITH TRUSSES

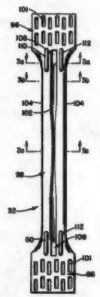
Joaquin J. Palacio, and Carlos C. Cristobal, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 423,252, Sep. 24, 1982, Pat. No. 4,525,972, and a continuation-in-part of Ser. No. 456,359, Jan. 7, 1983, Pat. No. 4,464,885. This application Sep. 2, 1983, Ser. No. 528,967

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.⁴ E04C *3/02*

U.S. Cl. 52—693 **32 Claims**



1. An attachment member adapted for connection of two spaced apart wooden members comprising:

(a) first and second connection plates disposed at opposite ends of an intermediate leg section, said connecting plates each having two sides and a plurality of teeth projecting generally perpendicular to said connecting plates from one side of said connecting plates, said connecting plates being disposed in the same plane; and

(b) said intermediate leg section interconnecting said connecting plates and having a groove extending from the same side of said attachment member as said teeth projecting from said connecting plates and extending substantially the entire length of said intermediate leg section between said connecting plates, the depth of said groove varying along its length with such depth being greatest in the proximity of said connecting plates and smallest in the center of said intermediate leg section between said connecting plates and said intermediate leg section having a pair of side flanges attached to and projecting from said intermediate leg section on the outside edges of said intermediate leg section and extending in the same direction from said attachment member as said groove.

4,570,408

BEAM ASSEMBLY

Francesco Frascaroli, Bologna, and Carlo Biondi, S.Giovanni in Persiceto, both of Italy, assignors to C.O.M. Cooperativa Operai Metallurgici s.c.r.l., Bologna, Italy

Filed May 21, 1984, Ser. No. 612,331

Claims priority, application Italy, Jun. 10, 1983, 5006/83[U]

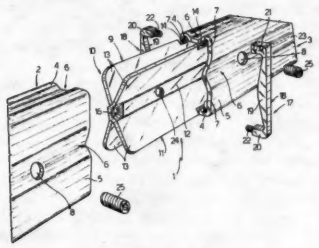
Int. Cl.⁴ E04C *3/32*

U.S. Cl. 52—726 **3 Claims**

1. A beam assembly (1) comprising at least a first and a second hollow beam (2,3) arranged in a head-to-head relationship, and disengageable connecting means (9) engaging both said beams (2,3) to connect the same to one another, said connecting means (9) comprising:

(a) two members (10,11) arranged close to each other and each extending partly inside said first hollow beam (2) and partly inside said second hollow beam (3), each member consisting of a substantially rectangular member compris-

ing a center portion and two non-parallel side portions lying in planes converging with a plane of the central portion, the members being in contiguous contact along their respective center portions to form a generally X-shaped cross-section when in a relaxed state and being adapted to be inserted with loose sliding fits into the interiors of the beams, the first member having at least two



tapped holes therethrough located in the center portion and near opposite ends of the plate; and

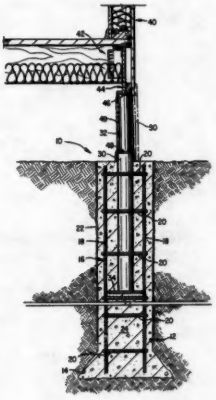
(b) screw means for threading into the tapped holes in the first member and for bearing against the center portion of the second member to force the plates apart at the center portions and thereby force the side portions into tight contact with an internal surface of both said beams (2,3).

4,570,409

FOUNDATION SYSTEM FOR MODULAR AND MOBILE HOUSING

David R. Wilks, Plano, Tex., assignor to Palm Harbor Homes, Inc., Dallas, Tex.

Filed Dec. 7, 1983, Ser. No. 558,906
Int. Cl.⁴ E04G *21/00*
U.S. Cl. 52—742 **13 Claims**



1. A method of supporting a housing module comprising:

forming a bore hole in the earth to a predetermined depth;

positioning a concrete reinforcing structure in the bore hole;

subsequently filling the bore hole with concrete;

positioning an outer support member in the concrete in the bore hole prior to the setting thereof;

positioning a module over the outer support member;

extending an inner support member between the outer support member and the chassis of the module; and

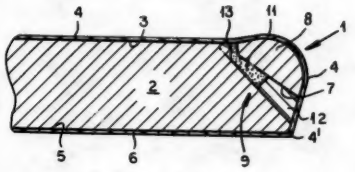
securing the inner support member to the chassis of the module and to the outer support member.

4,570,410

COMPOSITE PLATE AND METHOD OF MAKING SAME

Wilhelm Tuneke, Ense-Höingen, and Jürgen Weber, Arnsberg, both of Fed. Rep. of Germany, assignors to Duropal-Werk Ebehr. Wrede GmbH & Co. KG, Arnsberg, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,956
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329372; Sep. 3, 1983, 3331842
Int. Cl.⁴ A47B *13/08;* B27M *3/18;* B27H *1/00;* E04C *2/00*
U.S. Cl. 52—811 **19 Claims**



1. A composite plate comprising:

a core having an upper and a lower surface and separated from a rounded edge portion by an upwardly and inwardly extending wedge-shaped groove having a wide mouth at an edge of said core proximal to said lower surface and terminating in a narrow groove portion at said upper surface whereby said edge portion is deflected to lie above said upper surface;

a decorative sheet adhesively bonded to said upper surface and extending across said groove portion, around said edge portion and closing said mouth; and

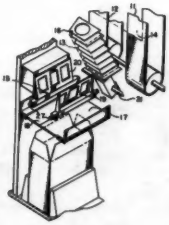
a durable filling in said groove extending from said mouth to the end of said groove portion.

4,570,411

BAG FOLDING AND LOADING MACHINE HAVING IMPROVED SWATTER

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 26, 1984, Ser. No. 654,360
Int. Cl.⁴ B65B *63/04*
U.S. Cl. 53—117 **11 Claims**



1. A machine for folding and loading thin film sheet articles into a carton comprising:

a folding assembly;

delivery means for delivering said thin film articles to a position adjacent said folding assembly; and

a pivotal swatter for transferring said articles from said delivery means to said folding assembly, said pivotal swatter including:

a plurality of vanes located on planes substantially aligned with the direction of motion of said pivotal swatter, said swatter contacting said article along three sides of said vanes to form said article into a U-shaped configuration upon delivery at said loading assembly.

4,570,412

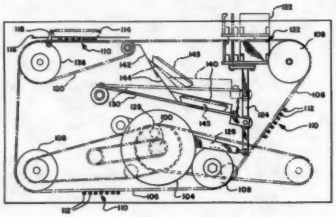
DROPPED-PACKAGE CATCHER

Glenn R. Stockmeier, Troy, and Fritz F. Treiber, Centerville, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Feb. 8, 1984, Ser. No. 578,146

Int. Cl.⁴ B65B *61/00*

U.S. Cl. 53—167 **4 Claims**



1. In a wrapping machine including an elevator for raising packages into sheets of wrapping material which are then wrapped about the packages and conveyor means for conveying packages from a feed-in tray to said elevator, an improvement comprising dropped-package catcher means coupled to said elevator to follow the reciprocating movement thereof for catching packages which may drop from said conveyor means or said elevator whereby dropped packages are prevented from engaging operating apparatus of the wrapping machine which engagement can otherwise lead to machine damage, destruction of the dropped packages and/or machine jams.

4,570,413

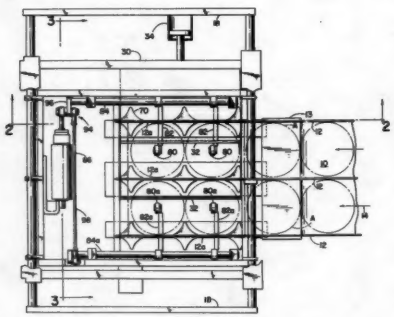
CASE PACKER WITH LOAD DECELERATING AND IMPACT ABSORBING MEANS

John L. Raudat, North Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed May 17, 1984, Ser. No. 611,336

Int. Cl.⁴ B65B *21/02, 39/02*

U.S. Cl. 53—247 **5 Claims**



1. A case packer of the type adopted to form arrays of articles and to drop these article arrays into upwardly open packing cases, said packer comprising

(a) means for conveying cases to a load station, and said load station including resilient platform means for so supporting the case that dropping the articles into the case causes said resilient platform means to provide displacement of said platform means,

(b) grid structure above the load station and including lane defining means to receive articles in side-by-side columns and form the arrays, support means for the articles, and means to shift said article support means so that the articles are free to drop downwardly into a case,

(c) means for impeding the descent of the articles so dropped from said grid structure,

(d) said grid structure including individual article pocket defining finger clusters depending downwardly into the case so located at said load station, and

(e) said article impeding means comprising individual article following control arms associated with at least some of said pockets and movable between adjacent finger clusters to engage the bottoms of the articles so dropped and impede their descent downwardly toward the packing case, said load station including a base structure for movably supporting said platform, and means acting between said base and said platform to provide a resilient biasing force acting upwardly to urge said platform toward a position to receive articles dropped into a case so located at said load station, said means so acting between said base and said platform providing a resilient restoring force that is related to the downward motion of said platform to absorb the impact of articles dropped into a case, means for so moving said control arms includes longitudinally extending rock shafts defining said parallel axes, and fluid motor means coupled to said shafts to rotate them in sequential relationship to the movement of said article support means into said second positions.

4,570,414

APPARATUS FOR CLOSING AND TRANSPORTING AWAY ESPECIALLY POUCH PACKS

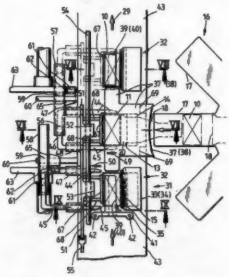
Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,616

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222102

Int. Cl.⁴ B65B *51/30*

U.S. Cl. 53—373 **14 Claims**



1. An apparatus for transporting pouches comprising:

(a) feed conveyor means (**16**) for transporting pouches to a pre-conveyor means;

(b) pre-conveyor means (**19**) for receiving pouches from said feed conveyor means, and for transporting said received pouches to a discharge conveyor means, said pre-conveyor means including means for operating on pouches (**32, 33, 34**) while in said pre-conveyor means,

(c) wherein said pre-conveyor means (**19**) comprises a plurality of pack receptacle regions (**30, 31**), one of said pack receptacle regions being positioned at a feed station to receive pouches from said feed conveyor means (**16**) while another of said pack receptacle regions is simultaneously

positioned at a discharge station to permit transfer of a pouch therein to the discharge conveyor means to thereby enable said pre-conveyor to transport a pouch from one of its pack receptacle regions to said discharge conveyor means while a pouch is received by another pack receptacle positioned at said feed station from said feed conveyor means,

(d) at least first and second discharge stations, and means for reciprocating each said one and said another of said pack receptacle regions between said feed station and one of said discharge stations, and

(e) discharge conveyor means (**21**) for receiving pouches from said pre-conveyor means and transporting the received pouches for further processings.

4,570,415

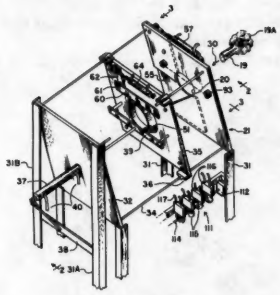
VEGETABLE BANDING APPARATUS

Edward M. Centeno, Salinas, Calif., assignor to Mann Packing Co., Inc., Salinas, Calif.

Filed Jun. 13, 1984, Ser. No. 620,274

Int. Cl.[4] B65B *13/24*

U.S. Cl. 53—399 **11 Claims**



6. The method of placing an elastic band around a vegetable bunch comprising the steps of:

providing a top plate assembly forming a first opening centered about a central axis and sized to receive said vegetable bunch,

providing a band stretcher having a second opening centered about said central axis and having a plurality of fingers positioned for movement towards and away from said central axis to receive the elastic band and stretch it about said second opening,

placing an elastic band over said fingers when the fingers are positioned adjacent said central axis,

moving said fingers away from said central axis to stretch the elastic band,

placing the bunch into said first and second openings,

moving said fingers towards the central axis to relax the band about the bunch, and

shifting the band stretcher along the central axis to disengage said fingers from the elastic band and move said band stretcher out of alignment with the bunch.

4,570,416

OVERNIGHT PACKAGE

David B. Shoenfeld, Cordova, Tenn., assignor to Federal Express Corporation, Memphis, Tenn.

Filed Oct. 3, 1983, Ser. No. 538,121

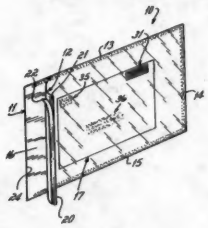
Int. Cl.[4] B65B *61/00*

U.S. Cl. 53—415 **2 Claims**

1. The method of handling express envelopes in a two ply package formed of a backing member and a front ply, a substantial portion of which is a transparent film,

entering the recipient's name on a manifest having a pressure-sensitive tracer label mounted on it;

addressing with the recipient's name and address an envelope having a shipper's address thereon;



securing said tracer label to said envelope or package;

and inserting said envelope in said package with said address and label visible through said film.

4,570,417

PROCESS FOR LOADING A SHIPPING CONTAINER WITH VEHICLES

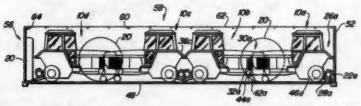
Friedhelm Herr, Heddesheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed May 25, 1984, Ser. No. 614,345

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1983, 3320332

Int. Cl.[4] B65B *5/00*

U.S. Cl. 53—428 **2 Claims**



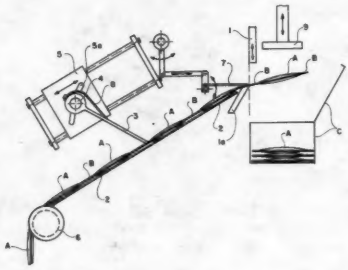
1. A process for loading a shipping container with at least two tractors which each include a rear portion supported by a pair of transversely spaced rear drive wheels having brakes, a narrow forward portion joined to the rear portion, a transverse front axle assembly connected to the forward end of and extending laterally beyond opposite sides of the narrow forward portion, a pair of front support wheels connected to the opposite ends of the front axle, and a drive means in said tractor for driving said drive wheels, and each tractor having a height greater than the height of the container and a width slightly narrower than the width of the container, comprising the steps of: (a) replacing the pair of rear drive wheels of each tractor with a pair of auxiliary wheels; (b) removing the front support wheels from the front axle of each tractor and the front axle from the forward portion of each tractor; (c) fixedly mounting a frame to the forward end of the forward portion and fixedly mounting a single front auxiliary wheel to said frame at the forward end of the forward portion of each tractor, with the diameters of the auxiliary wheels being such that the tractor has a height less than that of the container; (d) driving a first of the tractors under its own power in reverse into one end of the container and steering the tractor by operating said brakes such that as it approaches a rear wall of the container, the tractor is caused to assume a position wherein its longitudinal axis is slanted relative to a longitudinal axis of the container; (e) driving a second of the tractors under its own power forwardly into the container and steering by its brakes so that the forward portion thereof overlaps and is substantially parallel to a considerable length of the forward portion of the first tractor.

4,570,418

DEVICE FOR THE AUTOMATIC BOXING OF BAGS OR SACHETS INTO CONTAINERS

Donati Gino, Via Carpignola, 64, a Cattolica (FO), Italy

Filed Jul. 26, 1982, Ser. No. 401,944
Claims priority, application Italy, Jul. 27, 1981, 631 A/81
Int. Cl.[4] B65B *61/06, 5/10*
U.S. Cl. 53—435 **9 Claims**



1. An apparatus for the automatic boxing into at least one container individual bags filled with granular material from a continuous strip of bags having a sealing strip between said bags, comprising

cutter means for cutting along a central line of said sealing strip at a given cutting location,

feeding means for said cutting location having an inclined surface and at least one moving path thereon for supporting said continuous strip for movement thereon,

holding means for holding a first of said individual bags of said continuous strip at said cutting location,

said at least one container being positioned beneath said cutting location to receive by force of gravity said individual bags upon being cut by said cutting means, and

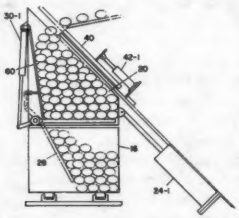
pusher means adjacent said cutting means and moving therewith in a direction for assisting the gravity fall of said individual bags towards a stacked array in said at least one container.

4,570,419

MEASURING AND TRANSFER SYSTEM

Charles E. Tinsley, Ventura, Calif. 93003

Filed Nov. 10, 1983, Ser. No. 550,928
Int. Cl.[4] B65B *1/06, 1/36, 39/12*
U.S. Cl. 53—473 **26 Claims**



1. A system for measuring and loading product into containers comprising:

means for movably mounting boxes or other containers to be filled at a loading position;

support means for receiving a predetermined quantity of fruit or other products in a volume which equals the capacity of said containers;

means for moving said support means downward toward the container to be filled;

means for feeding the product from said support means into said containers including a product feeding member extending into said containers to control the feeding of said products into said containers, said product feeding member being secured to a lower portion of said support means;

means for raising said support means and said product feeding means to a product receiving location;

means for removing the filled container and for bringing an empty container into the loading position; and

means including said support means for defining a substantially closed triangular volume having an apex near the top thereof, for receiving said fruit or other products substantially at said apex of said triangular volume as said triangular volume is being filled;

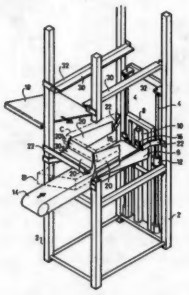
whereby an accurate and consistent filling of said container is achieved.

4,570,420

METHOD AND APPARATUS FOR CLOSING AND STACKING BOXES

Omri Raz, Hagalil Hamaaravi, Israel, assignor to Eshet Eilon, Hagalil Hamaaravi, Israel

Filed Mar. 27, 1984, Ser. No. 593,888
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—485 **12 Claims**



1. A method of closing open-ended boxes of rectangular configuration with covers of corresponding compensation, characterized in:

sequentially feeding said boxes to a box-closing station;

sequentially feeding said covers to said box-closing station, each of which covers has a top wall and a peripheral side wall and is fed such that its top wall overlies the open end of the box at the box-closing station;

interposing fitting-leaf means between the outer face of the open end of the box and the inner face of the peripheral side wall of the cover aligned therewith at the box-closing station, while effecting relative movement between the cover and the box towards each other to fit the cover over the open end of the box as guided by said fitting-leaf means;

said fitting-means including leaves extending along three sides of the box, and the relative movement between the box and cover being effected while the cover is at an incline with respect to the box such that the open end of the box is first received within the cover from a fourth side of the box not provided with a fitting leaf; and

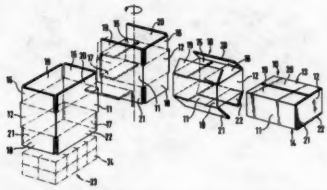
withdrawing said fitting-leaf means from between the side wall of the cover and the box closed thereby.

4,570,421

PROCESS AND APPARATUS FOR CLOSING CARTONS

Heinz Focke, Verden, and Hugo Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,920
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301237
Int. Cl.[4] B65B *7/20, 51/02;* B31B *1/36, 1/76*
U.S. Cl. 53—491 9 Claims



1. A method for closing cartons during transport of said cartons, said cartons consisting of side-walls, and of top and bottom walls formed out of upper interior and exterior flaps and lower interor and exterior flaps, respectively, in which the top and bottom interior and exterior flaps can be folded over from their initial position in the plane of the side-walls to the plane of the top and bottom walls, respectively, comprising the steps of:

(a) folding the top and bottom interior flaps (**15, 17**) which are forward in the initial direction of transport by movement of the carton relative to fixed, immobile folding devices;

(b) moving the cartons so that what has heretofore been the initial back sides of the cartons relative to the initial direction of transport are now turned to face a second direction of transport;

(c) moving the cartons in said second direction of transport;

(d) folding the remaining top and bottom interior flaps (**16, 18**) by movement of the cartons relative to fixed, immobile folding devices, in said second direction of transport;

(e) folding the top and bottom exterior flaps (**19, 20, 21, 22**) by means of further movement of the carton (**10**), relative to fixed, immobile folding devices, in said second direction of transport.

4,570,422

APPARATUS FOR BUNDLING ELONGATE ARTICLES

Kozo Watanabe; Masashi Kawada, both of Kurobe, and Yozo Okada, Toyama, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 10, 1984, Ser. No. 639,481
Claims priority, application Japan, Feb. 25, 1984, 59-34694
Int. Cl.[4] B65B *13/32, 27.10*
U.S. Cl. 53—557 14 Claims

1. An apparatus for bundling a number of elongate articles with a band, comprising:

(a) a bundle tray;

(b) a reel for the band web;

(c) a feed mechanism for supplying a length of the band web from said reel onto said bundle tray;

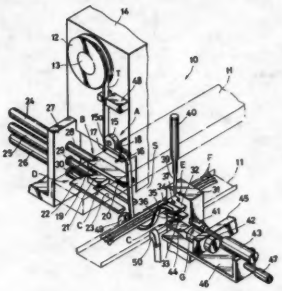
(d) a discharger for discharging a number of elongate articles onto said length on said bundle tray;

(e) a gripper mechanism disposed on one side of said bundle tray for gripping a free end of said length;

(f) a presser mechanism disposed on an opposite side of said bundle tray for pressing an opposite end of said length so as to be gripped by said gripper mechanism with said length surrounding said elongate articles;

(g) a fusing mechanism for fusing end portions of said length to each other;

(h) a holder mechanism for holding said elongate articles when said opposite end of said length is gripped by said gripper mechanism; and



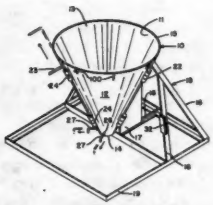
(i) a cutter mechanism for cutting said length off said band web at said opposite end of said length as it is gripped by said gripper mechanism, thereby producing a band bundling said elongate articles.

4,570,423

TREE BALL WRAPPING DEVICE

Russell DeLong, R.D. #3, Box 280, Bernville, Pa. 19506

Filed Dec. 11, 1984, Ser. No. 680,386
Int. Cl.[4] B65B *47/00*
U.S. Cl. 53—578 5 Claims



1. A tree ball wrapping apparatus comprising a tripartile truncated conical shaped holder assembly of metal having an included angle of less than 60° and having a major circular periphery in a plane at a right angle to the cone's central axis and a minor elipsoidal periphery in a plane inclinded toward the central axis at a truncating angle and having a first rearmost fixed part which is attached to a base such that the holder is held upright and a second and a third part which form hinged doors attached by hinges to the fixed part and whose free adjacent edges are equipped with a latching bar receiving means such that the doors may be latched together by a slidably installed latching bar to form the cone and having installed equally spaced apart on the holder's outer surface along the major periphery of each part a multiplicity of tie-cord receiving hooks and installed in each door centrally near the minor periphery a tie pin receiving aperature which has installed therein slidably an "L" shaped tie pin such that each tie pin crosses one over the other interiorly in the holder and is held by an aperature spaced a defined distance apart from another aperature in the fixed part near the minor periphery thereof such that the tie pins cross each other at right angles and having a tie cord with a free end which is woven around the hooks and tie pins to form a sling over which is installed a sheet of biodegradable material which enwraps a conical tree ball as it is set down over the sheet and sling into the holder

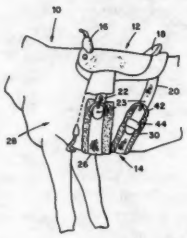
thereby permitting the material to be tied snugly around the ball when it is removed from the holder.

4,570,424

CINCH FOR A WESTERN SADDLE

Roy G. Simpson, Cookeville, Tenn., assignor to Adams Plastics, Inc., Cookeville, Tenn.

Filed Dec. 4, 1984, Ser. No. 678,180
Int. Cl.[4] B68C *1/00*
U.S. Cl. 54—23 **5 Claims**



1. For use with a western saddle having a cinch strap, an off strap, and flank cinch billets, a cinch comprising:

a flexible front cinch member for extending between the cinch strap and the off strap and having two ends for attaching to the cinch strap and the off strap of the saddle, said front cinch member having a midsection for extending under the rib cage of the horse;

flexible near-side and off-side flank cinch members for extending from the midsection of said front cinch member to the flank cinch billets on either side of the saddle and for attaching to the flank cinch billets; and

means for securing said near-side and off-side flank cinch members to the midsection of said front cinch member with substantial portions of said flank cinch members extending along the rib cage of the horse and to provide an interconnection area for conforming to the contours of the horse's rib cage, said securing means securing said near-side and off-side flank cinch members adjacent to the lowermost point of said front cinch member;

whereby said near-side and off-side flank cinch members are operable to apply pressure to the rib cage of the horse to hold down the rear portion of the saddle.

4,570,425

HYDRAULICALLY OPERATED GANG MOWER TRAILER

Jack Carr, Glenview, Ill., assignor to Roseman Mower Corporation, Glenview, Ill.

Division of Ser. No. 502,643, Jun. 9, 1983, Pat. No. 4,481,755. This application Aug. 10, 1984, Ser. No. 639,589
Int. Cl.[4] A01D *75/30, 69/00*
U.S. Cl. 56—7 **2 Claims**

1. A hydraulically operated gang mower trailer connectable to a tractor having a source of pressurized hydrualic fluid, including:

a plurality of hydraulically driven mowers mounted on the trailer and movable between raised and lowered positions,

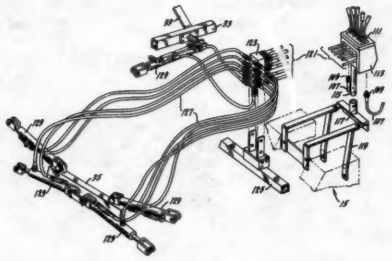
a plurality of hydraulic cylinders mounted on the trailer for raising and lowering the hydraulic driven mowers,

a stacked set of lever operated hydraulic spool valves for controlling the flow of hydraulic fluid to and from the hydraulic cylinders,

flexible hydraulic fluid feed and return conduits connected to the hydraulic cylinders and to the stacked set of spool valves,

a flexible feed conduit and a flexible return conduit connecting the source of pressurized hydraulic fluid of the tractor and the stacked set of spool valves,

the flexible feed and return conduits having quick connection fittings to the stacked set of spool valves, and



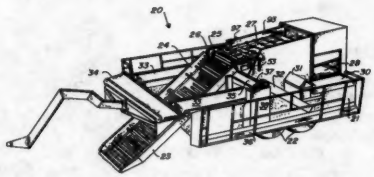
means mounting the stacked set of lever operated hydraulic spool valves on the tractor for easy removal from the tractor and mounting on the trailer after disconnection of the flexible feed and return conduits.

4,570,426

TOMATO HARVESTER WITH IMPROVED SEPARATION OF TOMATOES FROM OTHER PICKED UP MATERIAL

Darryl G. Bettencourt, Lodi, and Thomas S. Bettencourt, Isleton, both of Calif., assignors to Blackwelders, Rio Vista, Calif.

Filed Aug. 1, 1984, Ser. No. 636,608
Int. Cl.[4] A01D *45/00*
U.S. Cl. 56—327 R **4 Claims**



4. A shaker for a tomato harvester comprising:

a crankshaft at the rear of said shaker having two series of crank pins, that of one series being located 180° apart from those of the other series, said crank pins thereby constituting a first force couple,

two alternating series of walking bars mounted pivotally at the forward end of the shaker and mounted on said crank pins at the rear of said harvester,

said crankshaft having at each end of a pair of timing journals extending at 90° to the crank pins with the outside said journals being located 180° with respect to the two journals mounted inwardly thereof, to provide two more force couples in balance, and

a counterweight secured to said crankshaft at each end, the two counterweights forming a force couple equal and opposite to said first force couple.

4,570,427

APPARATUS FOR SPLICING TEXTILE THREADS

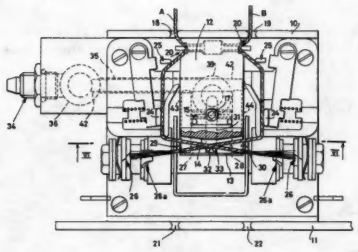
Mauro Premi, Saló, and Gianfranco Guzzoni, Puegnago, both of Italy, assignors to Mesdan S.p.A., Saló, Italy

Filed May 30, 1984, Ser. No. 615,304

Claims priority, application Italy, Jun. 3, 1983, 21455 A/83; Oct. 7, 1983, 23202 A/83

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—22 20 Claims



1. Apparatus for splicing ends of textile threads or yarns by means of compressed air comprising: a body defining a mixing chamber which has lateral outlets on opposite sides of the body; cutting means arranged at each of said sides of the body for cutting the threads or yarns to thereby provide free ends to be spliced; and means for dressing such free ends prior to splicing, by effecting opening and separation of the fibers of the threads or yarns, said dressing means including, at each of said sides of said body, at least one pretreating nozzle connectable through a valve with a source of compressed air to emit a jet of compressed air directed in a direction away from the respective side of said body and substantially intersecting a straight line connecting the respective lateral outlet of the mixing chamber with the respective cutting means when in position ready for cutting, whereby the free ends of the threads or yarns are dressed by a whipping effect, produced by currents of air, in free spaces at locations outside and adjacent said lateral outlets of said mixing chamber.

4,570,428

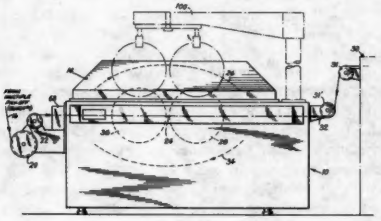
TWIN TRACK BUNCHER

Andrew Blackmore, King City, Canada, assignor to Ceeco Machinery Manufacturing Limited, Concord, Ontario, Canada

Filed Apr. 23, 1984, Ser. No. 602,667

Int. Cl.[4] D07B *3/10;* D01H *7/86*

U.S. Cl. 57—58.65 14 Claims



1. A twin bobbin bow double twist buncher comprising: a frame; a cradle mounted on said frame defining a longitudinal axis of the double twist buncher and including means for supporting two wire receiving bobbins proximate to each other, said cradle being provided with bobbin engaging means for selectively engaging the bobbins prior to winding of wire thereon and disengaging the same when said bobbins are full with wire and are to be removed from the double twist buncher; first and second bearing means provided at each axial end of said cradle; first and second wire carrier means mounted on respective bearing means for rotation about said longitudinal axis of said cradle for movement relative to said frame, cradle and bobbins, each wire carrier means defining a wire path extending substantially between said bearing means; first inlet guide means disposed proximate said first bearing means for receiving a first group of wires or strands to be twisted, said first inlet guide means being mounted for rotation together with said first wire carrier means about said longitudinal axis, said first inlet guide means being positioned to guide the first group of wires or strands into one end of said first wire carrier means; second inlet guide means disposed proximate said second bearing means for receiving a second group of wires or strands to be twisted, said second inlet guide means being mounted for rotation together with said second wire carrier means about said longitudinal axis, said second inlet guide means being positioned to guide the second group of wires or strands into one end of said second wire carrier means; first outlet guide means disposed proximate the other end of said first wire carrier means for receiving the wires or strands from said first wire carrier means and guiding the same proximate to a first bobbin; second outlet guide means disposed proximate the other end of said second wire carrier means for receiving the wires or strands from said second wire carrier means and guiding the wires or strands proximate to a second bobbin; traverse means for traversing the axial lengths of the bobbins and laying the first and second groups of wire to be respectively wound onto the bobbins; drive means for driving said wire carrier means and bobbins; and control means for controlling the operation of said drive means, whereby each group of wires or strands introduced at an opposite axial end of the buncher is imparted a first twist at a respective inlet guide means and imparted a second twist between associated outlet guide and traverse guide means and laid on an associated bobbin.

4,570,429

THREAD GUARD FOR SPINNING OR TWISTING MACHINE

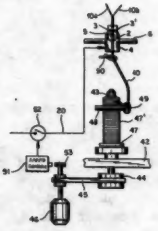
Hermann Güttler, Uhingen, and Bernd Lagemann, Göppingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 465,922

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204936

Int. Cl.[4] D01H *13/16, 13/18*

U.S. Cl. 57—81 20 Claims



1. In textile machinery wherein two threads merge at a junction into a yarn by the action of drawing means engaging said yarn under tension downstream of said junction, the combination therewith of:

a support;

a thread guard comprising a carrier swingable on said support about an axis at least generally perpendicular to the path of the yarn between a normal metastable position and an off-normal position, said carrier being provided with a

guide bracketing the yarn and permitting same to run through said thread guard in said normal position and entangling the threads to cause rupture thereof under the force of said drawing means in said off-normal position;

means connected to said guard for monitoring the threads and for displacing said guide from said normal position to said off-normal position when one of said threads ruptures so that said guide ruptures the other thread;

locking means on said support activatable for engaging said carrier and immobilizing same in said normal position; and

switch means operatively coupled with said drawing means for automatically activating said locking means and engaging same with said carrier to immobilize same only upon a significant slackening of the tension exerted upon the yarn during normal operation of said drawing means.

4,570,430

YARN PIECING ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

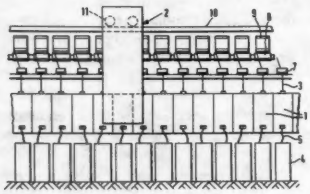
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 16, 1984, Ser. No. 631,075

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325928

Int. Cl.[4] D01H *15/02*

U.S. Cl. 57—263 **22 Claims**



1. Process for piecing yarn at a spinning unit of an open-end friction spinning machine of the type having:

a pair of friction rollers rotatably drivable in the same direction and disposed adjacent one another to form a yarn forming wedge-shaped gap therebetween,

fiber feeding and opening device means including a fiber feeding channel means for feeding single fibers to the wedge-shaped gap, a part of the fiber feeding channel means being dispoed in a movable lid-shaped component covering at least a portion of the wedge-shaped gap and having a mouth opening to the wedge-shaped gap,

yarn withdrawal means for withdrawing the formed yarn from the wedge-shaped gap, and

suction device means for applying suction forces to hold the spinning yarn in the wedge-shaped gap, said process comprising the sequential steps of:

exposing at least a portion of the wedge-shaped gap by moving away the lid-shaped component,

introducing the spun yarn end into the mouth of the fiber feeding channel means in the lid-shaped component,

returning the lid-shaped component to its closed position covering the wedge-shaped gap,

carrying out the yarn piecing steps of switching on of the yarn withdrawal means and the fiber feeding and opening device means, and of transferring the free end of the spun yarn end through the mouth opening of the fiber feeding channel means to the wedge-shaped gap.

9. Apparatus for open end friction spinning comprising a plurality of spinning units, each having:

a pair of friction rollers rotatably drivable in the same direction and disposed adjacent one another to form a yarn forming wede-shaped gap therebetween,

fiber feeding and opening device means including a fiber feeding channel means for feeding single fibers to the wedge-shaped gap, a movable lid-shaped component covering at least a portion of the wedge-shaped gap and having a mouth opening to the wedge-shaped gap, at least a portion of the fiber feeding channel means being disposed in the movable lid-shaped component,

yarn withdrawal means for withdrawing the formed yarn from the wedge-shaped gap,

suction device means for applying suction forces to hold the spinning yarn in the wedge-shaped gap, the spun yarn and being insertable into the mouth of the fiber feeding channel means in the lid-shaped component when in the open position, and

yarn piecing control means for carrying out piecing operations subsequent to return of the lid-shaped component to its closed position.

4,570,431

DEVICE FOR GRIPPING AND HOLDING A TUBE

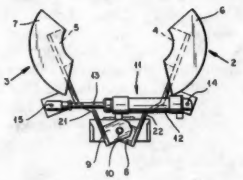
Wolfgang Igel, Ebersbach, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 582,084

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3305991

Int. Cl.[4] D01H *9/00;* **B65G** *49/00*

U.S. Cl. 57—275 **4 Claims**



1. In a textile machine, a device for gripping and retaining a tube, especially a roving package tube having a winding layer formed with a frustoconical end and from which an extremity of said tube projects, said tube having an axis, said device comprising:

a pair of opposing gripper elements each having a cylindrical portion engageable with said extremity of said tube and a frustoconical segmental portion adapted to rest against said end of said layer;

respective layer arms carrying said gripper elements at corresponding ends of said lever arms whereby said frustoconical segmental portions project generally transversely to said lever arms, the cylindrical and frustoconical segmental portions of said gripper elements being substantially centered on said axis when said cylindrical portions engage said extremity of said tube;

means defining an articulation between opposite ends of said arms from those carrying said gripper elements whereby said lever arms are coupled by a common pivot and swingable about said pivot, said pivot having an axis parallel to the first-mentioned axis; and

a piston-and-cylinder unit having a cylinder pivotally connected to one of said arms between its said ends and a piston pivotally connected to the other of said arms between its ends, said piston-and-cylinder units extending generally transversely to said arms between said gripper elements and said pivots.

4,570,432
TWO-STAGE TWISTING DEVICE FOR COMMUNICATION CABLES

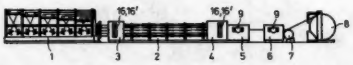
Dieter Vogelsberg, Coburg, and Wolfgang Feese, Neustadt, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 10, 1985, Ser. No. 721,599

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3414017; Jan. 28, 1985, 3503254

Int. Cl.[4] H01B *13/04*

U.S. Cl. 57—293 **10 Claims**



1. In a two stage twisting device, having a machine axis, for the simultaneous twisting of conductors for communication cables to form at least ten twisted units such as pairs or star quads and for the immediately subsequent twisting of the twised units to form a bundle, including:

(a) several SZ-twisting devices arranged in a first twisting stage operating in parallel and each of said SZ-twisting devices having, at the exit of the first twisting stage, a rotating twisting head, with said twisting heads arranged in a frame radially disposed with respect to the machine axis;

(b) at the transition from the first to the second twisting stage, a guidance system for each twisted unit for the deflection of the twisted units into the machine axis, said guidance system including at least two guide pulleys which are provided with a guiding groove, staggered with respect to each twisting unit, the running surface of the innermost guide pulley being approximately tangential to the machine axis; and

(c) a second twisting stage with its twisting axis on said machine axis, the improvement comprising;

(d) the twisting heads of the twisting devices of the first twisting stage arranged in at least two groups radially staggered to form at least an inner and an outer group of twisting heads;

(e) further guide pulleys for the twisted units associated with the outer twisting heads disposed between the inner and outer twisting heads; and

(f) guide pulleys between the machine axis and the inner twisting heads which are closest to the machine axis having a further guiding groove for a further twisting unit associated with an outer twisting head.

4,570,433
YARN END BLOWING NOZZLE

Helmut Nickolay, Göppingen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,325

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, 3314278

Int. Cl.[4] D01H *13/00, 15/00;* **B65H** *54/22, 54/86*

U.S. Cl. 57—305 **9 Claims**

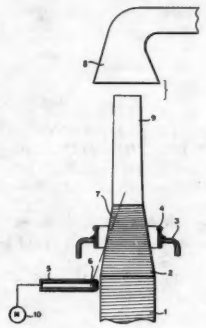
1. In a textile machine having a yarn end releasing nozzle for the pneumatic release of yarn end from a yarn package, the improvement wherein said nozzle is flat, reaches toward said yarn package at one side, and is formed along an edge juxtaposed with said package with a plurality of closely spaced mutually parallel passages training respective jets of air at an inclination against said package, said passages having a spacing less than twice the passage diameter.

7. A textile machine comprising:

means having a bobbin forming a yarn package with an axis;

a yarn end suction hood opening toward said bobbin at one axial end thereof for receiving a broken yarn end released from said package; and

a nozzle adapted to be supplied with compressed air for releasing said yarn end from said package, said nozzle having a flat blade reaching toward said package and lying in a plane perpendicular to said axis, said blade being formed along an edge thereof with a row of mutually



parallel passages training respective jets of air to said end of said package at an inclination of 15° to 40° to said axis, said passages having a spacing of the same order of magnitude as their diameters.

4,570,434
FIBER FEED ARRANGEMENT FOR OPEN-END FRICTION SPINNING

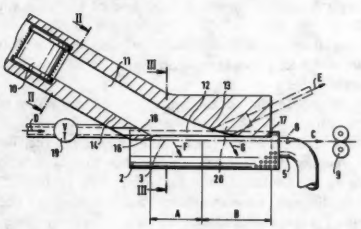
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,136

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320768

Int. Cl.[4] D01H *7/882, 7/892*

U.S. Cl. 57—401 **17 Claims**



1. Open end friction spinning apparatus comprising:

drivable friction surface means defining a yarn formation zone,

fiber supplying means for supplying individual fibers to the yarn formation zone,

suction device means for applying suction forces to the area of the yarn formation zone to assist in feeding the fibers thereto and to hold the same during yarn formation thereat,

and yarn withdrawal means for withdrawing yarn from the yarn formation zone,

wherein said fiber supplying means includes a fiber feed channel extending at an angle to the longitudinal extension of the yarn formation zone wherein the mouth of the fiber feed channel is widened in the area of the yarn formation zone and the fiber feed channel wall facing the yarn formation zone is curved convexly to facilitate control of the

fiber transport air stream and fibers to optimize alignment of the fibers in the yarn formation zone.

17. Apparatus according to claim 1, wherein the drivable friction surface means comprises a pair of adjacently arranged friction rollers rotatably drivable in the same direction and the yarn formation zone comprises a wedge-shaped gap formed between the pair of friction rollers.

4,570,435

FIBER FEED CHANNEL ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

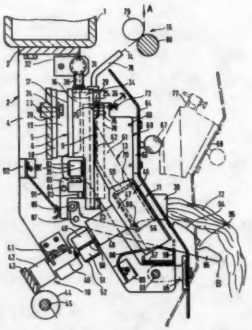
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 647,237

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333051

Int. Cl.⁴ D01H *7/882*

U.S. Cl. 57—401 **21 Claims**



1. Apparatus for open-end friction spinning including a plurality of spinning units, at least one of the spinning units including:

driveable friction surface means defining a yarn formation zone, said friction surface means being drivably supported in housing means,

fiber inlet and opening device means for opening fiber material to be spun,

fiber feed channel means for feeding fibers from the fiber inlet and opening device means to the yarn formation zone, said fiber feed channel means including a fiber feed opening facing the yarn formation zone, a portion of the fiber feed channel means including the fiber feed opening being formed in a movable channel carrier means, said carrier means being selectively movable between an operational closed position and at least one open position with the yarn formation zone exposed for maintenance operations,

centering means for adjustably positioning said channel carrier means with respect to both the housing means and the inlet and opening device means whereby return of said channel carrier means to its operational closed position returns the portion of the fiber feed channel carried thereby to its adjusted position with respect to the yarn formation zone and with respect to the inlet and opening device means, and

yarn withdrawal means for withdrawing spun yarn from the formation zone.

18. Apparatus according to claim 1, wherein the driveable friction surface means comprises a pair of adjacently arranged friction rollers drivable in the same direction, and the yarn formation zone comprises a wedge-shaped gap between the pair of rollers.

4,570,436

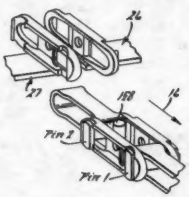
APPARATUS FOR ASSEMBLING CONVEYOR CHAIN

Donald S. Wilkie, 22535 Maple, St. Clair Shores, Mich. 48081

Filed Sep. 30, 1982, Ser. No. 430,783

Int. Cl.⁴ B21L *9/06*

U.S. Cl. 59—7 **4 Claims**



1. An apparatus for assembling conveyor chain comprising:

(A) a base;

(B) means supported on said base for aligning a pair of side links and a first center link;

(C) means supported on said base for assembling a first pin in assembled relationship with said pair of side links and said first center link;

(D) means supported on said base for aligning a second center link with said pair of side links;

(E) means supported on said base for assembling a second pin in assembled relationship with said pair of side links and said second center link; and

(F) means supported on said base for advancing assembled side links and center links;

said means for aligning a pair of side links and a first center link having for each of said pair of side links, a feed rack for holding a plurality of side links and means for guiding a side link from said feed rack to an aligned position, and for said center link, a feed rack for holding a plurality of center links and means for guiding each center link from said feed rack to an aligned position; said means for assembling said first pin and said means for assembling said second pin each having a feed rack, means for inserting each said pin through said side links and respective center link and means for rotating each said pin into assembled position.

4,570,437

ENERGY CONDUCTOR CHAIN

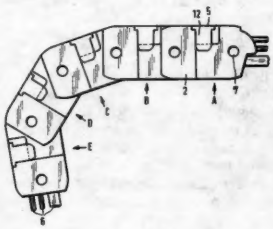
Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed May 17, 1984, Ser. No. 611,416

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318365

Int. Cl.⁴ F16G *13/00*

U.S. Cl. 59—78.1 **11 Claims**



1. In a chain for supporting energy conduits from an attachment point to a movable consuming load, comprising a plurality of chain links, wherein each of the chain links comprises a

U-shaped receiving part which is formed as a single piece of stable shape, said U-shaped receiving part has legs which form two outer plates and a first cross member connecting said plates together, said plates of adjacent chain links overlap and are releasably pivotally directly connected to each other, said plates forming stops for limiting a mutual angle of swing with respect to the adjacent chain links, the improvement comprising

a removable second cross-member comprising a closure yoke which is pivoted via a joint to one of said outer plates and has a resilient hook for releasably locking said closure yoke to the other of said outer plates, and

said joint comprises

a hinge pin which freely extends on a free edge of said one outer plate, said hinge pin having a flattened cross section with rounded sides, and

one end of said closure yoke remote from said hook is formed with an undercut edge opening, said hinge pin removably engages in said opening.

4,570,438

PULSE-CONTROLLED TURBINE

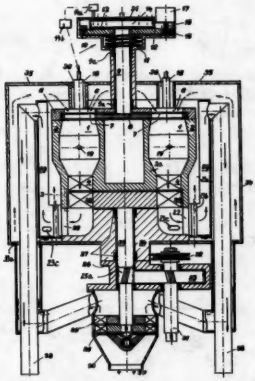
Edmund Lorenz, Badendorf 54, A-8413 St. Georgen a.d. Stiefing, Austria

Filed Oct. 25, 1983, Ser. No. 545,138

Claims priority, application Austria, Oct. 27, 1982, 3937/82

Int. Cl.⁴ F02C *5/12*

U.S. Cl. 60—39.39 **18 Claims**



1. A pulse-controlled gas turbine engine comprising:

means defining at least one combustion chamber;

intake means at one side of said chamber including valve means for selectively admitting air for combustion of a medium to said chamber and blocking the escape of said air from said chamber at said side;

means for igniting the medium in said air in said chamber to effect combustion of said medium in said air and generate gases in said chamber,

turbine means at another side of said chamber including guide vanes and rotor vanes and including a rotor driven by expanding gases resulting from combustion in said chamber;

drive means for said valve means for effecting cyclically in succession the introduction of said medium into said chamber, the combustion of said medium in said chamber and the expansion and discharge of gases through said turbine means; and

means for decoupling said drive means from said valve means automatically upon said expansion whereby said intake means and said turbine means ensure that said combustion is effected substantially isochorically.

4,570,439

EXHAUST CONTROL SYSTEM FOR 2-CYCLE ENGINES

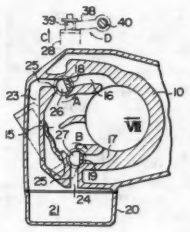
Eizaburo Uchinishi, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 11, 1984, Ser. No. 680,505

Claims priority, application Japan, Dec. 12, 1983, 58-234700; Dec. 29, 1983, 58-248125

Int. Cl.⁴ F02B *27/02*

U.S. Cl. 60—314 **1 Claim**



1. An exhaust control system for 2-cycle engine comprising: a main exhaust passage opening into the combustion chamber; at least one auxiliary exhaust passage opening into said combustion chamber on the side of the main exhaust passage and leading to an intermediate portion of said main exhaust passage; a control valve provided in said auxiliary exhaust passage and adapted to selectively shut-off said at least one auxiliary exhaust passage; an expansion chamber communicatable with said main exhaust passage through said control valve; and a valve operating means for operating said control valve such that, when said engine is operating at low speed, said control valve allows said expansion chamber to be communicated with said main exhaust passage while shutting off said at least one auxiliary exhaust passage and, as the engine speed is increased, said control valve gradually shut off said expansion chamber from said main exhaust passage while gradually opening said at least one auxiliary exhaust passage.

4,570,440

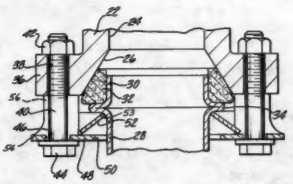
ARTICULATED CONNECTOR

Daniel W. Doran, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 2, 1985, Ser. No. 751,104

Int. Cl.⁴ F01N *7/10*; F02B *27/02*

U.S. Cl. 60—322 **4 Claims**



1. In a vehicle, an improved connector between the ends of two tubular exhaust components permitting relative angulation therebetween, comprising:

a seating surface formed in an end portion of one exhaust component;

an end portion of the second exhaust component having radially outwardly extending flange means formed thereon and spaced closely to the end thereof;

an annularly shaped seal ring encircling the end portion of the second exhaust component and having a surface adapted to sealingly engage the seating surface of the first

exhaust member, the seal ring also engaging the radially outwardly extending flange means of the second exhaust component to prevent axial movement of the seal ring away from the seating surface;

a conically shaped washer-type spring having an outer diameter edge and an inner diameter edge encircling the second exhaust component with the inner diameter edge being axially fixed in a direction toward the valve seat surface by the flange means of the second exhaust component;

a spring back-up plate having a relatively large diameter central aperture encircling the second exhaust component without touching and having a generally flat annular surface supporting the outer diameter edge of the spring at an axial position further from the seating surface than the inner edge and the flange means;

fastener means securing the spring back-up plate in spaced relationship to the end of the first exhaust component whereby the outer edge of the spring is moved axially toward the inner edge by flattening distortion thereof to produce a sealing force between the seal ring and the seating surface of the first exhaust component.

4,570,441

HYDRAULIC VEHICLE CONTROL SYSTEM

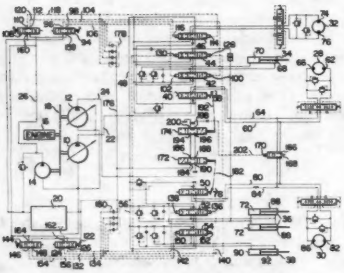
Kazuhiro Yoshida, Hirakata, and Takashi Murakami, Katano, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 506,984

Claims priority, application Japan, Jun. 29, 1982, 57-110721

Int. Cl.[4] F15B *13/09*; F16H *39/46*

U.S. Cl. 60—421 **4 Claims**



1. A hydraulic vehicle control system comprising:

(a) first and second pumps for supplying power fluid;

(b) implement actuator means;

(c) first and second bidirectional travel motors each having a forward travel port for the reception of the power fluid for rotation in a forward direction and a rearward travel port for the reception of the power fluid for rotation in a rearward direction;

(d) first implement valve means for controlling the delivery of the power fluid from the first pump to the implement actuator means;

(e) second implement valve means for controlling the delivery of the power fluid from the second pump to the implement actuator means;

(f) a first travel valve connected in parallel with the first implement valve means for controlling the delivery of the power fluid from the first pump to the forward and rearward travel ports of the first travel motor;

(g) a second travel valve connected in parallel with the second implement valve means for controlling the delivery of the power fluid from the second pump to the forward and rearward travel ports of the second travel motor;

(h) a straight travel valve for the on-off control of communication between the forward travel ports, and between the rearward travel ports, of the first and second travel motors, the straight travel valve being normally held closed to block communication therebetween, the straight travel valve being pilot actuated to open; and

(i) straight travel control means for causing the straight travel valve to allow communication between the forward travel ports, and between the rearward travel ports, of the first and second travel motors when the first and second travel valves are both actuated to set the first and second travel motors into rotation in the same direction, said straight travel control means comprising a source of pilot control fluid; and straight travel control valve means responsive to the actuation of the first and second travel valves for delivering the pilot control fluid to a pilot port of the straight travel valve when the first and second travel valves are both actuated to set the first and second travel motors into rotation in the same direction; said straight travel control valve means further comprising a first straight travel control valve normally blocking the pilot control fluid and allowing the pilot control fluid to pass therethrough on actuation of one of the first and second travel valves in either direction; and a second straight travel control valve for permitting the pilot control fluid from the first straight travel control valve to pass therethrough only when the other of the first and second travel valves is actuated in the same direction as said one of the first and second travel valves.

4,570,442

RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

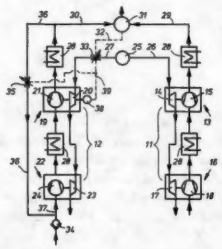
Herbert Deutschmann, Friedrichshafen; Gerhard Haussmann, Tettnang, and Ewald Kamleitner, Friedrichshafen, all of Fed. Rep. of Germany, assignors to MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH., Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,722

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411408

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—612 **4 Claims**



1. A piston internal combustion engine, comprising several exhaust gas turbocharger means, of which at least one is adapted to be disengaged during partial load operation of the internal combustion engine, an exhaust gas line and a suction line for each exhaust gas turbocharger means adapted to be disengaged, closure means in each of the exhaust gas line and suction line of a respective exhaust gas turbocharger means adapted to be disengaged, and control means for controlling during the engagement or disengagement of the respective exhaust gas turbocharger means the flow cross section of both closure means, said control means being operable during engagement with increasing yield in exhaust gas energy to initially open the exhaust gas closure means of the exhaust gas turbocharger means to be engaged in such a manner that the

continuously engaged exhaust gas turbocharger means is continued to be operated near its upper output limit, that only a strongly throttled rate of air flow is made possible to the compressor of the exhaust gas turbocharger means to be engaged during the engaging operation by means of a by-pass line adapted to be closed off which operatively connects a charging air manifold of the internal combustion engine with the suction line of the compressor downstream of the charging air closure means, and that the complete opening of the exhaust gas closure means is undertaken only when the exhaust gas turbocharger means has nearly reached the operating rotational speed necessary for the engagement.

4,570,443

METHOD FOR THE STEAM TREATMENT OF SEVERAL AUTOCLAVES AND APPARATUS FOR ITS IMPLEMENTATION

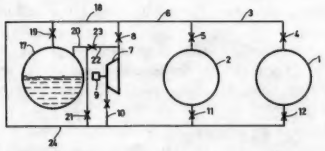
Manfred Specht, Groebenzell, Fed. Rep. of Germany, assignor to Ytong AG, Munich, Fed. Rep. of Germany

Filed Jul. 20, 1983, Ser. No. 515,637

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227097

Int. Cl.⁴ F01K *3/08*

U.S. Cl. 60—670 **3 Claims**



1. A method for operating a plurality of autoclaves of a bank of such autoclaves, especially for hardening aerated cement, in which steam is fed into the circuit, said method being characterized in that the steam is conducted out of a autoclave which is to be cooled and into an autoclave which is to be heated up until a pressure balance is reached, and then residual steam is suctioned off from the autoclave which is to be cooled using a steam compressor, is compressed and is forced into the autoclave which is to be heated up.

4,570,444

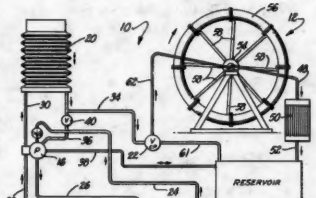
SOLAR MOTOR MEANS

Walter Gould, Calimesa, Calif. 92320

Filed Oct. 15, 1984, Ser. No. 661,057

Int. Cl.⁴ F03G *7/00*

U.S. Cl. 60—675 **19 Claims**



1. Motor means comprising a fluidtight, gravity-actuated rotor of generally wheel-like form having a substantially hollow rim, a substantially hollow hub and fluid passage means therebetween, said rotor being adapted for rotation in an upright position around a horizontal axis when in use;

said hub having a fluid inlet port and a fluid outlet port and said rotor being internally shaped to insure the movement of a compressed gas therethrough from the fluid inlet port to the fluid outlet port whereby when said compressed gas is introduced into said hub through said fluid inlet port and said rotor is positioned for use with a quantity of a suitable liquid incompletely filling the space therewithin, said compressed gas flows into contact with the surface of said liquid on one side of the vertical diameter of the rotor and exerts pressure thereon to cause movement of the liquid into space within said substantially hollow rim on the side of said vertical diameter opposite to said one side to thereby bring about a weight imbalance in said rotor causing is to rotate under the influence of gravity in a direction tending to relieve the imbalance as long as the compressed gas is fed into said hub through said inlet port.

4,570,445

METHOD OF ABSORBING THERMAL ENERGY AT LOW TEMPERATURE

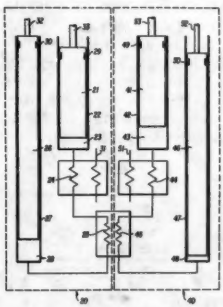
Kiyoshi Ishibashi, Toyota; Yujiro Ukai, Nagoya; Hideo Mita, Okazaki, and Yoshihira Shiroshita, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 25, 1984, Ser. No. 624,206

Claims priority, application Japan, Jun. 24, 1983, 58-114856

Int. Cl.⁴ F25B *9/00*

U.S. Cl. 62—6 **4 Claims**



1. A method of absorbing thermal energy at a low temperature in a refrigerating machine having a compressor, a radiator having a passage formed therein for being cooled, a heat exchanger and an expander, which comprises:

maintaining a minimum pressure of a working medium in the refrigerating machine so as to be continuously equal to or below a critical pressure of said working medium;

compressing said working medium by said compressor;

discharging thermal energy of said working medium, after being compressed, into a refrigerant flowing through said passage formed in said radiator;

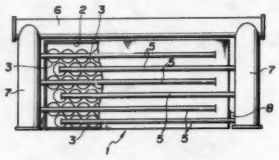
at least partly liquifying said working medium in said heat exchanger; and

expanding the liquified working medium by said expander.

4,570,446
FUEL TANK FOR HYDROGEN VEHICLE AND FUEL SUPPLYING SYSTEM

Yutaka Matsubara, Kodaira; Hisao Konno, Chofu, and Takashi Sasai, Gunma, all of Japan, assignors to Mitsui & Co., Ltd. and Japan Metals and Chemicals Co., Ltd., both of Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 669,061
Claims priority, application Japan, May 22, 1984, 59-102998
Int. Cl.[4] F17C *11/00*
U.S. Cl. 62—48 11 Claims

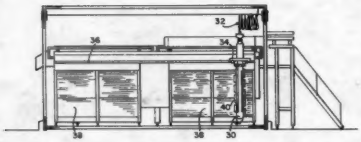


1. A fuel tank in a fuel supplying device for a hydrogen vehicle having a hydrogen-water engine comprising:
- a casing for the fuel tank,
- a header mounted integrally with said fuel tank,
- a plurality of fuel cylinders disposed in said casing and connected to said header for respectively containing hydrogen storage alloy selected from the group consisting of $LaNi_5$, mischmetal alloys, Ti-Zr-Mn-Cr-Cu alloys and Mg light alloys,
- a hydrogen gas supply conduit connected to said header, and
- an exhaust gas supply conduit connected to said casing for supplying the exhaust gas to externally heat said fuel cylinders in said casing.

4,570,447
REMOVING FROST DEPOSITS FROM COOLING-COIL BATTERIES IN A FREEZING PLANT DURING OPERATION

Staffan M. O. Jonasson, Helsingborg, Sweden, assignor to Frigoscandia Contracting AB, Helsingborg, Sweden

Continuation-in-part of Ser. No. 39,246, May 15, 1979, Pat. No. 4,528,820. This application Aug. 16, 1983, Ser. No. 523,528
Claims priority, application Sweden, May 19, 1978, 7895781
Int. Cl.[4] F25D *21/00*
U.S. Cl. 62—80 8 Claims

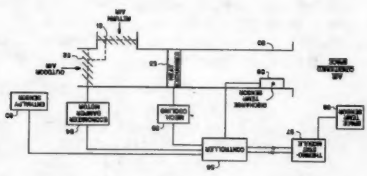


1. Apparatus for recurrently removing frost deposits from cooling-coil batteries or the like in a freezing plant during operation, while the state of aggregation of the removed frost deposit is maintained, comprising
- a plurality of compressed-air nozzles and means supporting said nozzles for imparting reciprocating motion to said nozzles longitudinally of the cooling-coil batteries and including a movable carriage which travels along a rail or track mounted adjacent said cooling-coil batteries, and
- means for furnishing to said nozzles compressed air of such pressure and temperature as to blow frost deposits from the cooling-coil batteries without melting such frost.

4,570,448
ECONOMIZER CONTROL APPARATUS

Gary A. Smith, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 12, 1983, Ser. No. 531,988
Int. Cl.[4] F25B *29/00*
U.S. Cl. 62—89 7 Claims

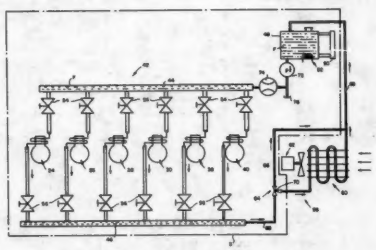


1. Thermostat apparatus for a system for controlling temperature in an air conditioned space by means of mechanical temperature changing equipment and an economizer for admitting outside air, said thermostat apparatus comprising:
- a temperature sensor for sensing a temperature in the air conditioned space;
- first set point means for establishing a first temperature set point;
- an enthalpy sensor for sensing enthalpy of the outside air;
- second set point means for establishing a second temperature set point substantially independent of the first temperature set point;
- a discharge air temperature sensor for sensing the temperature of air discharged into the air conditioned space; and
- controller means for controlling operation of the mechanical temperature changing equipment as the function of the temperature in the air conditioned space and the first temperature set point, and controlling operation of the economizer as a function of the temperature in the air conditioned space, the air discharged into the air conditioned space and the second temperature set point when the enthalpy of the outside air is lower than a predetermined value, said controller means maintaining said economizer closed when the enthalpy of the outside air is higher than the predetermined value.

4,570,449
REFRIGERATION SYSTEM

Charles R. Knokey, Rolling Hills Estates, and Paul S. Bedi, El Toro, both of Calif., assignors to ACL-FILCO Corporation, Santa Ana, Calif.

Filed May 3, 1984, Ser. No. 606,519
Int. Cl.[4] F25B *39/04*
U.S. Cl. 62—183 15 Claims



1. Apparatus for controlling temperatures in a plurality of independently operating compressors of a refrigeration unit,

wherein at least one of the compressors is operating at substantially all times, the apparatus comprising, in combination:

(a) transfer means including conduit means containing a liquid heat transfer working fluid for circulating the working fluid to the plurality of compressors in the refrigeration unit, and transferring heat from the operating compressor or compressors to the working fluid, the conduit means being in thermal interchange relation with each of the compressors, the transfer means including a plurality of coils equal in number to the number of compressors in an associated refrigeration unit, each of the coils associated with a different respective one of the compressors, a supply manifold and a return manifold, the coils connected to and arranged extending between the supply manifold and the return manifold, and a return line coupled to the return manifold and to the supply manifold bypassing the coils, for completing a fluid-conducting circuit; and

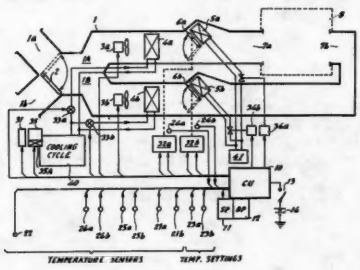
(b) temperature control means associated with the transfer means for maintaining the temperature of the liquid between predetermined limits and maintaining a predetermined minimum temperature on all non-operating ones of the compressors, the temperature control means including heat exchanger means coupled in the return line between the return manifold and the supply manifold for dissipating to a heat sink any unneeded heat transferred to the working fluid.

4,570,450

APPARATUS FOR CONTROLLING AUTOMOTIVE AIR CONDITIONERS

Akio Takemi, Kariya; Akiro Yoshimi, Oobu, and Takayoshi Kawai, Toyohashi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 14, 1983, Ser. No. 561,514
Claims priority, application Japan, Dec. 14, 1982, 57-219642
Int. Cl.[4] F25B *5/00, 41/00*
U.S. Cl. 62—199 **5 Claims**



1. An apparatus for controlling an air conditioner mounted on an engine driven vehicle having a passenger compartment, comprising:

means for forming first and second air distribution passageways and directing first and second air streams respectively therethrough to first and second areas of said passenger compartment;

first and second evaporators located in said first and second passageways respectively;

a refrigerant supply source including a variable capacity compressor for supplying refrigerant through said passageways to said evaporators;

temperature sensors for detecting the temperatures in said first and second areas and outside said passenger compartment;

temperature setting means for establishing reference temperatures for said first and second areas;

control means for estimating thermal energies of said first and second air streams, delivered from said evaporators, from said detected temperatures and said reference temperatures, evaluating said estimated thermal energies to generate a first control signal when either one of said first and second areas requires a cooling demand and a second control signal when both of said areas require said demand, and causing said compressor to operate at a lower or a higher capacity in response to said first and second control signals, respectively;

solenoid-operated clutch means for coupling said variable capacity compressor to the vehicle engine in response to each of said first and second signals and decoupling the compressor from the engine in response to the absence of said first and second signals; and

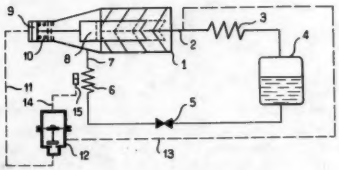
first and second solenoid-operated valve means respectively located in said first and second passageways for controlling the flow rates of said refrigerants passing therethrough in response to said first and second control signals, respectively.

4,570,451

PRESSURE-RATIO THRESHOLD SENSOR AND A MACHINE PROCESSING A LIQUEFIABLE GAS AND EQUIPPED WITH SUCH A SENSOR

Luc Langouët, Bridgeport, Conn., assignor to Bernard Zimmern, East Norwalk, Conn.

Filed Apr. 10, 1984, Ser. No. 598,929
Claims priority, application France, Apr. 14, 1983, 83 06080
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—228.3 **3 Claims**



1. A machine for processing a liquefiable gas, comprising a compressor provided with compression ratio adjustment means for changing over the compression ratio from a first, relatively low predetermined value to a second, relatively high predetermined value and conversely, said compressor being adapted to urge a first liquefiable gas from an intake region towards an exhaust region, and a device for comparing to a certain threshold value the ratio between an exhaust pressure, existing in said exhaust region, and an intake pressure, existing in said intake region, said device including a movable member, control means connected with said movable member, means for subjecting said movable member to a force which is proportional to the exhaust pressure and tends to move said movable member in a first direction, and on the other hand to a force which is proportional to the pressure of a second liquefiable gas which tends to move said movable member in a direction contrary to said first direction and is substantially in balance with its condensate, part at least of which condensate is in a housing adapted to be in thermal contact with a portion of the intake region where the first liquefiable gas is substantially in balance with its condensate, the second liquefiable gas having at a given temperature a vapor pressure which is substantially equal to said exhaust pressure when the pressure ratio equals the threshold value, wherein the control means of said device is operably connected to said compression ratio adjustment means in order to adjust the compression ratio to its first, relatively low, predetermined value when the exhaust pressure is below the threshold value with respect to the intake pressure, and to adjust the compression ratio to its second, relatively high, predetermined value, when the exhaust pressure is above the threshold value with respect to the intake pressure, and

wherein the movable member has a surface subjected to the exhaust pressure in a casing, and wherein the control means includes a valve member adapted to control communication through the casing between a conduit means connected to the exhaust region and a conduit means connected to a device adapted to actuate the compression ratio adjustment means.

4,570,452

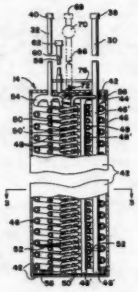
EARTH-TYPE HEAT EXCHANGER FOR HEAT PUMP SYSTEMS

Grady A. Bingham, Morehead City, N.C., assignor to Thermal Concepts, Inc., Morehead City, N.C.

Division of Ser. No. 421,143, Sep. 22, 1982, Pat. No. 4,516,629, which is a continuation-in-part of Ser. No. 365,992, Apr. 6, 1982, abandoned. This application Apr. 29, 1985, Ser. No. 728,232

Int. Cl.⁴ F24J *3/02;* **F28F** *13/14*

U.S. Cl. 62—260 **7 Claims**



1. In a heat pump heating and/or cooling system containing freon-type fluid, said system including above-ground components and an earth-type heat exchanger unit disposed during use of said system entirely below ground level, the improvement comprising:

said unit including a generally cylindrical coil assembly having a plurality of generally cylindrical fluid-conducting coils extending in substantially concentric relationship to each other about the central axis of said assembly, each of said coils being formed of heat conductive and corrosion resistant tubing the tubing of each coil being of different diameter than the tubing of each other coil;

and conduit means interconnecting said coil assembly and said above-ground system components for, during operation of said system, conducting said fluid to and from said fluid-conducting coils of said assembly.

4,570,453

APPARATUS FOR CONTINUOUSLY COOLING HEATED METAL PLATE

Hiroshi Kamio, Tokyo; Yasushi Ueno, Yokohama; Takao Noguchi, Tokyo; Kazuo Kunioka, and Shuzo Fukuda, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 648,878

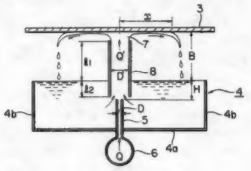
Claims priority, application Japan, Sep. 27, 1983, 58-177097

Int. Cl.⁴ F25D *17/02*

U.S. Cl. 62—375 **10 Claims**

1. In an apparatus for continuously cooling a heated metal plate lying horizontally, which comprises:

an upper cooling water ejecting means, arranged above said metal plate along at least one straight line parallel to the width direction of said metal plate, for substantially vertically ejecting cooling water onto the upper surface of said metal plate; an upper nozzle header for supplying cooling water to said upper cooling water ejecting means; at least one water tank, arranged below said metal plate, for receiving cooling water; a lower cooling water ejecting means having a lower cooling water ejecting bore, arranged in said water tank along at least one straight line parallel to the width direction of said metal plate, said lower cooling water ejecting bore being located under the surface of cooling water received in said water tank, said lower cooling water ejecting means ejecting, in the form of a jet stream, cooling water from said lower cooling water ejecting bore together with cooling water received in said water tank, substantially vertically onto the lower surface of said metal plate, said jet stream after ejection onto the lower surface of said metal plate being totally collected into said water tank; and, a lower nozzle header



for supplying cooling water to said lower cooling water ejecting means;

the improvement comprising:

a jet stream guide duct (**8**, **8'**) arranged substantially vertically between said lower cooling water ejecting means and the lower surface of said metal plate (**3**) so as to surround said jet stream (**7**), the lower portion of said jet stream guide duct being immersed into cooling water received in said water tank (**4**), the lowermost end of said jet stream guide duct being close to said lower cooling water ejecting bore of said lower cooling water ejecting means, and the uppermost end of said jet stream guide duct being spaced apart from the lower surface of said metal plate (**3**).

4,570,454

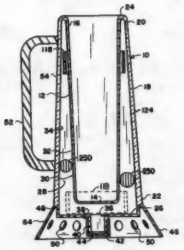
DRINKING MUG

Loyal E. Campbell, 2075 Fisher St., Huntsville, Ala. 35803

Continuation-in-part of Ser. No. 528,632, Sep. 1, 1983, Pat. No. 4,485,637, which is a continuation-in-part of Ser. No. 345,035, Feb. 2, 1982, Pat. No. 4,402,195. This application Nov. 29, 1984, Ser. No. 676,081

Int. Cl.⁴ F25D *3/08*

U.S. Cl. 62—457 **9 Claims**



1. A drinking vessel assembly comprising:

a circular-shaped tumbler;

a first wall surrounding the sides of and extending below said tumbler, said first wall being spaced from said tumbler, and a top of said tumbler and said first wall being sealably connected;

a second wall concentric with and spaced outwardly from said first wall, and a top of said second wall being sealably connected to said first wall;

a base extending across and closing a lower end of said first and second walls, said base being spaced from the bottom of said tumbler thereby defining a first cavity between said tumbler, said first wall and said base, and defining a second cavity between said first wall, said second wall and said base;

a fluid partially filling said first cavity;

a lip attached to and extending down from an outer region of said base to a lower edge forming a support for said assembly;

a series of spaced openings around and through said lip, enabling air circulation under said base of said container; and

a handle attached to the side of said second wall.

4,570,455

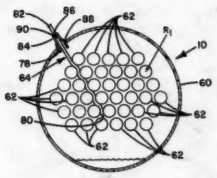
CONDENSER PURGE PROBE

Edward A. Huenniger, Liverpool, and Edson Byrns, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 4, 1985, Ser. No. 688,787

Int. Cl.[4] F25B *43/04*

U.S. Cl. 62—475 **11 Claims**



1. In a refrigeration system including an evaporator, a condenser enclosing a plurality of condenser tube members, and a purge system including a purge tank for removing noncondensible gases and other contaminants from the refrigeration system; a condenser purge probe for withdrawing noncondensible gases and other contaminants from the condenser, comprising:

an elongate flexible main body having an inlet disposed in said condenser and an outlet connected to said purge tank,

said elongate flexible main body including a portion thereof having a wave-like form comprising a plurality of alternating wave segments having exterior configurations approximating portions of the exterior configurations of said condenser tube members, said main body portion being selectively positionable in conforming and interlocking relationship with selected ones of said condenser tube members, thereby permitting selective placement of said main body inlet within said condenser and substantially reducing vibration of said main body during operation of said condenser.

4,570,456

DIRECT FIRED HEAT EXCHANGER

Robert C. Reimann, Lafayette, N.Y., and Richard A. Root, Spokane, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 13, 1984, Ser. No. 670,098

Int. Cl.[4] F25B *15/00*

U.S. Cl. 62—476 **4 Claims**

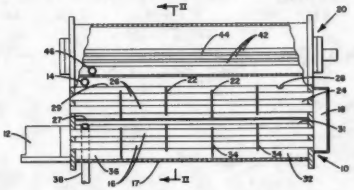
1. Apparatus for supplying heat to an absorption refrigeration system comprising:

an absorption refrigeration system including an absorber, an evaporator, a generator, a condenser, refrigerant, and absorbent solution divisible into a strong solution and a weak solution;

means for passing combustion gas through said generator, said means having an inlet and an outlet;

housing means defining a passageway for the absorbent solution, said housing means including walls and a bottom portion for enclosing said combustion gas supplying means, said passageway guides the flow of the absorbent solution therethrough;

a plurality of spaced apart plates in said housing means transverse to the flow of the absorbent solution, said plates



alternately attached to and spaced from said bottom portion to control the flow of the absorbent solution in an undulating motion; and

an inlet and outlet means for supplying and removing absorbent solution to and from said housing means, said inlet supplying the absorbent solution juxtapose the outlet passing combustion gas through said generator and said outlet removing the absorbent solution juxtapose the inlet passing combustion gas through said generator.

4,570,457

CRYOGENIC COOLING APPARATUS

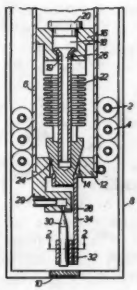
David N. Campbell, Warwickshire, England, assignor to The Hymatic Engineering Company Limited, Redditch, England

Filed Jan. 7, 1985, Ser. No. 689,372

Claims priority, application United Kingdom, Jan. 26, 1984, 8402060

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—514 JT **13 Claims**



1. Cryogenic cooling apparatus adapted to be connected to a pressurised supply of refrigerant gas, said apparatus including a generally tubular heat exchanger, a container, an expansion nozzle within said container and a valve member cooperating with said nozzle to vary its effective area for automatically varying the flow of said refrigerant gas, said heat exchanger affording two paths through one of which refrigerant gas flows, in use, to said expansion nozzle to liquefy a portion of said gas in said container whereafter the gas returns through the other said path, one of said nozzle and said valve member being fixed and the other being movable and connected to a first guide member, said first guide member affording a first guide surface and cooperating with a fixed second guide surface, at least one of said first and second guide surfaces being tapered in the direction of relative movement of said nozzle

and said valve member, whereby when said valve member and said nozzle are in the relatively open position and guide surfaces are in contact, and thus substantially prevent relative lateral movement of said valve member and said nozzle, and as said valve member and said nozzle progressively move into the relatively closed position said guide surfaces become progressively spaced apart.

4,570,458

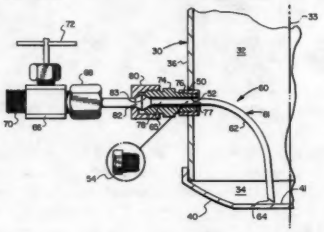
METHOD AND APPARATUS FOR EXTRACTING LIQUID FROM A VAPOR COMPRESSION REFRIGERATION SYSTEM

Richard J. Avery, Jr., 5419 Mercedes, Dallas, Tex. 75206

Filed Sep. 7, 1984, Ser. No. 648,755

Int. Cl.[4] F25B *43/00*

U.S. Cl. 62—503 **10 Claims**



1. A device for use in a vapor compression refrigeration system having a refrigerant flow circuit including a compressor, condenser, evaporator and a vessel forming a liquid sump interconnected by refrigerant flow line means, said vessel being located in said circuit between said evaporator and said compressor, and said vessel including a boss and a removable plug closing an opening in said boss, said device comprising:

a substantially rigid fluid conduit having an inlet end;

valve means connected to said conduit for closing said conduit to fluid flow;

connector means disposed on said conduit for connecting said conduit to said vessel at said boss and for orienting said conduit in such a way that said inlet end is disposed in said sump to conduct liquids accumulating in said sump out of said circuit through said valve means; and

means on said conduit cooperable with said connector means for locating said conduit in a fixed predetermined position relative to said sump when said connector means is secured to said boss.

4,570,459

COMPOUND NEEDLE FOR WARP KNITTING MACHINE

Adolf Hägel, Bad Steben, Fed. Rep. of Germany, assignor to Liba Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,494

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315446

Int. Cl.[4] D04B *35/04*

U.S. Cl. 66—120 **3 Claims**

1. A compound needle for a warp knitting machine comprising

a needle stem (1) having a breast portion (7) at one end and a hook (5) at the other end,

said hook (5) having an open portion thereon,

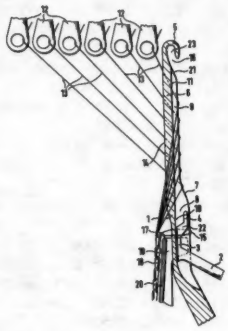
a first groove (8) located in said breast portion (7) in substantially longitudinal alignment with said hook (5),

sliding means (2,3,4 and 22) being reciprocated between a forward, closed position wherein the open portion of said hook (5) is covered and a rearward, open position wherein the open portion of said hook (5) is uncovered,

a connecting portion (6) on said needle stem (1) intermediately disposed between said hook (5) and said breast portion (7),

said connecting portion (6) and said breast portion (7) adapted to receive a plurality of yarns (13),

a second groove (9) in said connecting portion (6) and forming an extension of the first groove (8) to accommodate said slide means during its reciprocated movement,



said sliding means having an inclined member (22) collecting the plurality of yarns laid over said connecting portion (6) and said breast portion (7) for movement of the plurality of yarns into the open portion of said hook (5) before it is covered.

4,570,460

WARP FEEDING DEVICE FOR CIRCULAR KNITTING MACHINE

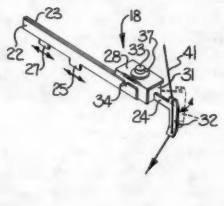
Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed May 9, 1985, Ser. No. 732,051

Claims priority, application Japan, May 18, 1984, 59-101345

Int. Cl.[4] D04B *9/32, 15/60*

U.S. Cl. 66—135 **9 Claims**



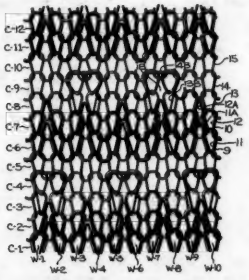
1. A wrap yarn feeding device for wrapping walewise extending yarns about selected groups of needles of a circular series of needles in a circular knitting machine of the type including a rotary needle cylinder, said wrap yarn feeding device comprising a radially slotted dial coaxial and rotatable with said needle cylinder, first and second cooperating sliders supported for radial sliding movement in the slots of said dial, a yarn wrapping arm having an inner end pivotably supported about a vertical axis by said second slider, said wrapping arm having an outer end including yarn guide means to receive and to wrap the yarn about said selected group of needles, said second slider being operative to move said wrapping arm in a radial path extending across the needle circle, said first slider being operative to move said wrapping arm in an arcuate path about its axis, and pattern means in said dial for imparting such operative movement to said first and second sliders.

4,570,461

EYELET AND TERRY KNIT FABRIC AND METHOD

Masatoshi Sawazaki, Kobe, Japan, assignor to Precision Fukuhara Works, Ltd., Kobe, Hyogo, Japan

Filed Jun. 27, 1984, Ser. No. 625,113
Claims priority, application Japan, Jul. 29, 1983, 58-140097
Int. Cl.[4] D04B *9/12, 15/02*
U.S. Cl. 66—194 3 Claims



1. A weft knit jersey fabric having a combination of eyelet openings and of terry pile loops therein, the fabric having courses of jersey stitches in a series of recurrent needle wales connected by sinker wales, said jersey stitches of certain of said courses being formed of only a first body yarn while said jersey stitches of other of said courses being formed of a second body yarn and of a pile yarn, said certain and said other courses alternating in said fabric, a plain course of jersey stitches positioned between some of said certain and said other courses, the structure of selected pairs of jersey stiches of said first body yarn in adjacent needle wales of said certain courses forming an eyelet loop in the intervening sinker wale, the yarn of said eyelet loop being spread coursewise and being incorporated in flanking jersey stitches of said first body yarn in said certain courses and to thereby form said eyelet openings in the fabric, and the structure of selected pairs of adjacent needle wale jersey stitches of said second body yarn and of said pile yarn in said other courses forming a terry loop in the intervening sinker wale, said pile yarn between said adjacent needle wale jersey stitches being elongated relative to the corresponding sinker wale loops of said second body yarn and to thereby form said terry pile loops, said certain courses containing said eyelet openings being devoid of said terry pile loops, and said other courses containing said terry pile loops being devoid of said eyelet openings.

4,570,462

WARP KNITTING MACHINE WITH JACQUARD GUIDES

Josef Roth, Seligenstadt, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Jun. 8, 1984, Ser. No. 618,882
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321733
Int. Cl.[4] C03B *15/02*
U.S. Cl. 66—204 10 Claims

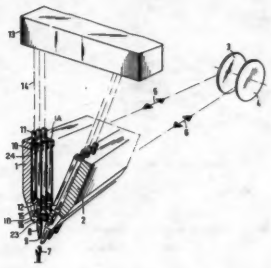
1. A warp knitting machine comprising:

a plurality of needles;

a Jacquard guide bar having at least one pair of stopping surfaces;

a plurality of Jacquard-controlled guides each having a displaceable forward end and each having a rearward end attached to said Jacquard guide bar, said pair of stopping surfaces being spaced and positioned to straddle a given one of said Jacquard-controlled guides and;

at least one displacement means for reciprocating said given one of said Jacquard-controlled guides against said pair of stopping surfaces through a distance of about one needle space, said stopping surfaces straddling said given one of



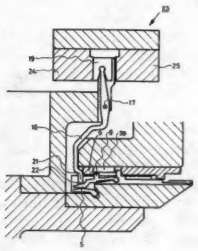
said Jacquard-controlled guides at a position between its forward end and its point of contact with said displacement means.

4,570,463

NEEDLE SELECTION DEVICE FOR A KNITTING MACHINE

Günter Otto, Couvet, Switzerland, assignor to Edouard Dubied & Cie. S.A., Couvet, Switzerland

Filed Dec. 19, 1983, Ser. No. 562,729
Claims priority, application Switzerland, Dec. 22, 1982, 7483/82
Int. Cl.[4] D04B *15/78, 9/06*
U.S. Cl. 66—221 11 Claims

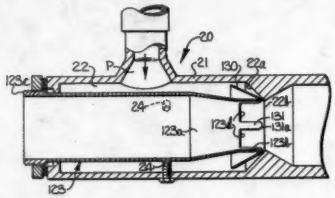


1. In a needle selection device of the type used in a knitting machine having revolving needle carrier means for carrying needles to a selector station which includes electromagnetic selection means, apparatus comprising one pivotable selector means for each respective needle, said pivotable selector means being disposed remote from said needle carrier means and having one end thereof selectably driven by said electromagnetic selection means to pivot said pivotable selector means about a pivot axis and another end thereof for actuating said respective needle carried by said needle carrier means; a jack supported on said revolving needle carrier means and coupled to said needle and pivotable between an active position for causing the needle coupled thereto to be selected for operation and an inactive position by which said needle coupled thereto is not selected for operation, said jack being selectively contacted by said other end of said pivotable selector means to determine whether said jack pivots to said active or inactive position; and spring means associated with said jack for exerting a bias force thereon to normally urge said jack to said active position thereof.

4,570,464
JET DYEING APPARATUS

Jack E. Thompson, Rocky Mount, N.C., assignor to Texfi Industries, Inc., Greensboro, N.C.

Filed Nov. 6, 1984, Ser. No. 668,748
Int. Cl.[4] D06B *3/24, 3/28*
U.S. Cl. 68—178 13 Claims



1. In apparatus for dyeing textile sheet material in endless rope form in which a stream of dye liquor is utilized to converge on the rope of textile material to penetrate and dye same and also cause the rope of material to pass through the dyeing apparatus, the improvement comprising:

housing means defining a generally cylindrical shaped dye liquor chamber having a tapered outflow section which terminates in a reduced diameter exit end;

a hollow generally cylindrical shaped nozzle tube for passage of the rope of textile material therethrough mounted concentrically within said housing means in spaced-apart relation thereto and forming a dye liquor passageway therebetween, said nozzle tube being longitudinally adjustable within said housing means and said nozzle tube also having a tapered outflow section which terminates in a reduced diameter exit end, the outflow section of said nozzle tube being positioned adjacent to and inwardly from the outflow section of said dye liquor chamber;

dye liquor redirecting means positioned and held between and contacting the respective outflow sections of said dye liquor chamber and said nozzle tube for redirecting the flow of the dye liquor from the outflow section of said dye liquor chamber to a path of flow between said redirecting means and the outflow section of said nozzle tube;

said nozzle tube having a plurality of cutouts adjacent the exit end thereof which cooperate with the surrounding dye liquor redirecting means to form an outflow dye liquor passageway wherethrough the dye liquor may flow in accelerated fashion and converge on the rope of textile material while the rope is passing through the nozzle tube and contacted by portions thereof so that the rope does not unduly twist and turn upon being subjected to the flow of dye liquor, and wherein the angle formed between the interior of said dye liquor redirecting means and the longitudinal axis of said nozzle tube is an acute angle and is no greater than about 30 degrees whereby a relatively gentle action is imparted by the dye liquor as it passes through the dye liquor redirecting means and converges on the rope of textile material.

4,570,465
PLURAL BRANCH LOCKING CABLE

Anthony B. Bennett, 401 E. 74th St., New York, N.Y. 10021

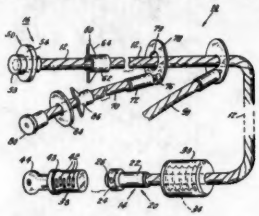
Filed May 14, 1984, Ser. No. 610,245
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—18 7 Claims

1. A plural branch locking cable means comprising:

a main cable having a distal end and a proximal end; a cable stop positioned at the distal end of the main cable for being disposed at the distal side of a part of an article to be secured, whereby when the cable is passed through an opening in the part of the article and the cable is moved to move the cable stop against the side of the part of the article facing toward the distal end of the cable, the cable stop thereafter prevents extraction of the cable from the opening in the part of the article;

locking means at the proximal end of the main cable for locking the proximal end of the main cable to a support, whereby the main cable is anchored to the support;

an auxiliary cable having a distal end for attachment to another article and a proximal end for attachment to the main cable; an auxiliary cable stop positioned at the distal end of the auxiliary cable for being disposed at the distal side of a part of an article to be secured, whereby when the auxiliary cable is passed through an opening in the part



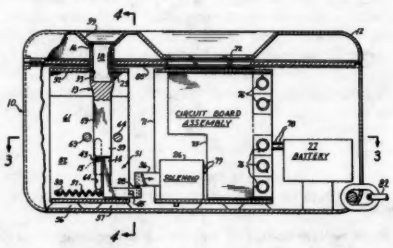
of the article to be secured by the auxiliary cable and the auxiliary cable is moved to move the auxiliary cable stop against the side of the part of the article facing toward the distal end of the auxiliary cable, the auxiliary cable stop thereafter prevents extraction of the auxiliary cable from the opening in the part of the article;

auxiliary cable attachment means at the proximal end of the auxiliary cable for attaching the proximal end of the auxiliary cable at the main cable and for permitting the position of the proximal end of the auxiliary cable along the main cable to be freely adjustable.

4,570,466
DOOR LOCKING METHODS AND APPARATUS

John W. Matthews, Incline Village, Nev., assignor to Laser Products Corporation, Fountain Valley, Calif.

Filed Sep. 9, 1983, Ser. No. 533,066
Int. Cl.[4] E05B *65/08, 49/00;* C14B *1/40*
U.S. Cl. 70—99 21 Claims



1. A method of releasably blocking a door, comprising in combination the steps of:

combining a first element with said door for blocking said door in an extended position of said first element and for alternatively releasing said door upon movement of said first element from said extended position;

releasably blocking said first element in said extended position by removably locating a second element in a path of movement of said first element;

locking said door by locking said first element in said extended position and blocking said locked first element with said second element;

releasing said locked first element by selectively removing said second element from said path of movement of said first element;

releasing said door by moving said released locked first element in said path of movement while said second element is moved from said path of movement of said first element;

subsequently restoring said first element to said extended position and said second element to a location in said path of movement of said first element;

selectively unlocking said first element while said first element is blocked by said second element; and

removing said blocked unlocked first element for a release of said door.

4,570,467

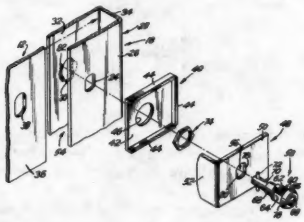
LOCKING SYSTEM FOR ROLLING TYPE GATE

Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465

Filed Sep. 19, 1983, Ser. No. 533,220

Int. Cl.⁴ E05B *65/08*

U.S. Cl. 70—99 **19 Claims**



1. A gate locking system comprising:

a gate;

at least one U-shaped channel guide rail;

a locking section on said guide rail including aligned apertures extending through opposing front and rear walls of said guide rail;

said gate being moveable within said guide rail between an open and a closed position, and said gate including an aperture aligned with said guide rail apertures when in said closed position;

a guard plate having an opening therein for positioning exteriorly of said locking section with said opening being aligned with said guide rail and gate apertures in said closed position;

an elongated lock member having an enlarged lock head, said lock member being insertable through a passageway defined by said opening, said guide rail apertures, and said gate aperture, said inserted lock member extending beyond said rear wall of said guide rail with said enlarged lock head being retained by said guard plate;

a lock guard positioned around said enlarged lock head for preventing tampering thereof, said lock guard including a tray member having a base wall and at least three upstanding side rims, and an aperture provided in said base wall;

said tray member being secured exteriorly onto said guide rail front wall at said locking section with said tray member aperture being aligned with said guide rail apertures to receive said lock member, said guard plate being received on said tray member within said tray member side rims to thereby prevent entry of a burglarizing tool between said guard plate and said guide rail; and

securing means cooperating with an extended end of said lock member for securing said lock member between said opposing front and rear walls of said guide rail with said gate being captured in said closed position to securely lock said gate in said closed position, said securing means being under operative control of a rotatable portion of said lock member.

4,570,468

DEVICE FOR LOCKING THE ROTATIONAL MOVEMENT OF A STEERING COLUMN OF A MOTOR VEHICLE

Wulf Bemm, Cologne; Rolf Brückner, Velbert, and Günter Eigelshofen, Wuppertal, all of Fed. Rep. of Germany, assignors to Neiman S.A., Courbevoie, France

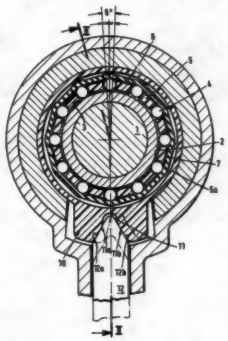
PCT No. PCT/EP83/00104, § 371 Date Dec. 23, 1983, § 102(e) Date Dec. 23, 1983, PCT Pub. No. WO83/03802, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 14, 1983, Ser. No. 579,897

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1982, 3216168

Int. Cl.⁴ B60R *25/02*

U.S. Cl. 70—252 **7 Claims**



1. In a device for locking the rotational movement of a steering column of a motor vehicle by means of a clamp locking mechanism with rollers parallel to an axis of said steering column, which rollers clamp the steering column in both rotational directions between a cylindrical track and clamping surfaces oblique to the track and are guided in a coaxial cage rotatable about the steering column, which coaxial cage can be carried along by the steering column in both rotational directions into one of two clamping positions and can be fixed in a central position located between the two clamping positions, in which central position the rollers release the steering column, the improvement wherein all of the rollers are surrounded externally by at least one elastic ring coaxial to the column and loading the rollers elastically towards the steering column.

4,570,469

KEY RETAINING DEVICE

Hildaur L. Neiisen, 2 Juniper St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 345,722, Feb. 4, 1982, Pat. No. 4,448,051, which is a continuation-in-part of Ser. No. 322,265, Nov. 17, 1981, Pat. No. 4,441,348. This application Apr. 14, 1983, Ser. No. 484,976

Int. Cl.⁴ E05B *11/00, 73/00*

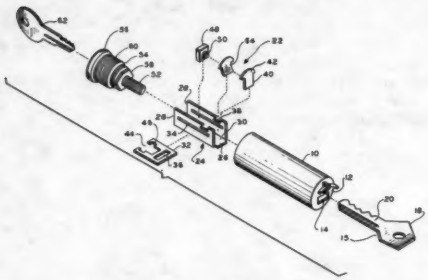
U.S. Cl. 70—389 **18 Claims**

1. A key retaining device for capturing and selectively locking a key having a working section and handle section comprising:

a housing having at least one end wall and a side wall and having a chamber therein;

said end wall having a slot therein communicating with said chamber and dimensioned to receive said working section of said key therethrough; and

means for selectively securing said working section of said key, including means to slideably actuate a clamping



member to releasably engage and secure said working section of said key within said chamber.

4,570,470

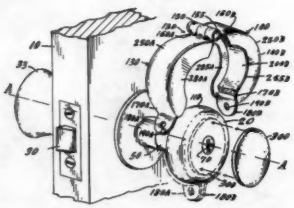
DOOR LOCK SECURITY DEVICE

William H. Gray, Sr., 126 Northgate Parkway East, Toledo, Ohio 43612

Filed May 14, 1984, Ser. No. 609,793

Int. Cl.[4] E05B 17/14

U.S. Cl. 70—428 **2 Claims**



1. A locking device for affixation over a doorknob handle of the type in which there is an integrally disposed key slot in said doorknob handle, having a circumference and an outer surface, said device comprising:

(a) a pair of semicircular members pivotally respectively having first ends and second ends, said semicircular members being pivotally joined one another on their adjoining first ends, each said semicircular member having a convex outer circumference and a concave inner circumference;

(b) flanged rimmed edges on each of the semicircular members, extending radially inwardly relative to each said semicircular member;

(c) locking means on the second end of each semicircular member to join together said respective semicircular members in a closed circle about the doorknob;

(d) disc means adapted to be inserted between the flanges on said semicircular members so as to rest against the front surface of the doorknob when the semicircular members are locked together.

4,570,471

ENGAGEMENT OF LOCK BODY WITHIN A HOLLOW DOOR-STILE

Alois Crepinsek, 97 N. Arizona Pl., Chandler, Ariz. 85224

Filed Sep. 16, 1983, Ser. No. 532,919

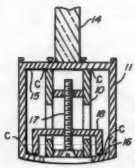
Int. Cl.[4] E05B 9/08

U.S. Cl. 70—451 **7 Claims**

1. An apparatus for engaging a lock body within the interior of a hollow tubular structural member of a door after said lock body has been passed freely to the interior of said structural member through an opening in said member provided for said passage therethrough, the improvement comprising:

screw actuated compression means screw-threadedly coupled to said lock body for rotation about the axis of a screw actuating said compression means and for translation along the same axis;

stop means coupled to said lock body for selectedly limiting rotation of said screw actuated compression means to at least one of two rotated positions, one position permitting ease of passage of said lock body through said opening in said structural member while said screw actuated compression means is coupled to said lock body, and one



position permitting compressive engagement of said compression means with the interior of said structural member as said compression means is screw actuated; and

surface contact means upon said lock body for bearing against a first interior surface of said structural member when said screw actuated compression means is actuated into compressive contact with a second interior surface of said structural member, wherein said surface contact means comprise screw adjustable extensions of said lock body adjustable for adapting said lock body for installation within structural members of various interior dimensions.

4,570,472

METHOD AND APPARATUS FOR CONTROLLING LATERAL UNSTABLE MOVEMENT AND CAMBER OF STRIP BEING ROLLED

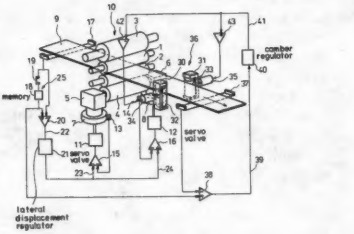
Hiroaki Kuwano, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,069

Claims priority, application Japan, Apr. 12, 1983, 58-64369

Int. Cl.[4] B21B 39/16, 37/00

U.S. Cl. 73—8 **2 Claims**



1. A method for controlling lateral unstable movement and camber of a strip being rolled which comprises detecting a lateral deviation of the strip entering and leaving a horizontal rolling mill and changing right and left roll gaps of said horizontal rolling mill in response to said deviation of the strip entering the horizontal rolling mill, thereby controlling the lateral unstable movement of the strip being rolled, and deriving the camber of the strip from the lateral deviation of the strip leaving said horizontal rolling mill and said lateral deviation of said strip entering the horizontal rolling mill correcting

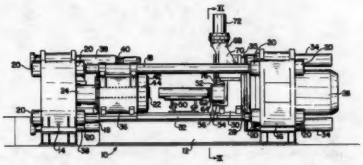
the camber of the strip being rolled by controlling the position of the rolls of a vertical rolling mill disposed downstream of said horizontal rolling mill.

4,570,473

EXTRUSION PRESS

Helmut B. Huertgen, Pittsburgh, Pa., assignor to Sutton Engineering Company, Pittsburgh, Pa.

Filed Feb. 23, 1984, Ser. No. 583,053
Int. Cl.⁴ B21C *35/04*
U.S. Cl. 72—255 **20 Claims**



1. In an extrusion press including a platen and a movable crosshead which supports the free end of a main ram for movement thereof toward and away from the platen and additionally including extrusion container means for supporting a billet intermediate the platen and the crosshead for extrusion of the billet through an extrusion die under the impetus of extrusion force applied by the main ram to the billet, the improvement comprising:

a butt shearing means carried by said crosshead;

said shearing means including a butt shear and a cooperable die support means carried by said crosshead and operable to shear the butt end of such a billet from such a die subsequent to extrusion of such billet in a manner that all reaction forces of the butt shearing are carried by said crosshead.

4,570,474

APPARATUS FOR BENDING METAL PLATE IN WIDTHWISE DIRECTION

Hiroshi Tanaka, Fujisawa; Sotozi Mitani, Sagamihara, and Yasushi Sakurai, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Oct. 5, 1984, Ser. No. 658,219
Claims priority, application Japan, Oct. 12, 1983, 58-189174
Int. Cl.⁴ B21D *7/04, 53/88*
U.S. Cl. 72—411 **9 Claims**

1. An apparatus for bending a metal piece of a plate shape, comprising:

a stationary lower die unit,

a substantially horizontal base plate on which a workpiece of a plate shape is placed substantially horizontally,

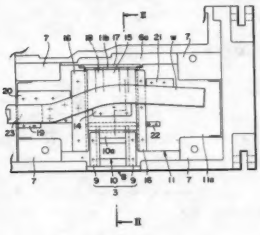
supporting means for supporting said base plate on said lower die unit in such a manner that said base plate is movable vertically,

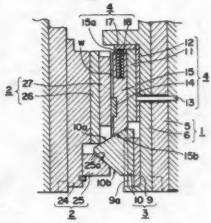
holding means mounted on said base plate for limiting horizontal movement of the workpiece relative to said base plate,

a slide cam mounted on said base plate and slidable along a horizontal straight line in forward and reverse directions opposite to each other, said slide cam having a slide cam face, and a bending die capable of abutting on one side of the workpiece and pushing the workpiece in the forward direction, said bending die being movable relative to said base plate and said holding means,

a vertically movable upper die unit having a press cam having a press cam face, and a substantially horizontal cover plate capable of confining the workpiece between said base plate and said cover plate and pushing said base plate and said slide cam downwards, and

a drive cam mounted on said lower die unit and slidable along the horizontal straight line in the forward and reverse directions, said drive cam having a front cam face on which said slide cam face can slide, and a rear cam face on which said press cam face can slide, said front cam face and said slide cam face being so inclined that said slide





cam is compelled to move relative to said drive cam in the forward direction when said slide cam face slides down on said front cam face, said rear cam face and said press cam face being so inclined that said drive cam is compelled to slide in the forward direction when said press die moves downwards.

4,570,475

BRAKE SHOE RESIZER

Robert A. Kerney, 1500 De Shields Dr., Evansville, Ind. 47712, and Alfred E. Hardy, 3112 Lincoln Ave., Evansville, Ind. 47714

Filed Jun. 1, 1984, Ser. No. 616,069
Int. Cl.⁴ B21D *37/00*
U.S. Cl. 72—412 **7 Claims**

7. A method for resizing openings in a brake shoe having an arcuate base plate and upstanding ribs positioned on said arcuate base plate, said ribs each including an aligned opening for selectively receiving an anchor pin therebetween, comprising the steps of placing said arcuate base plate of said brake shoe

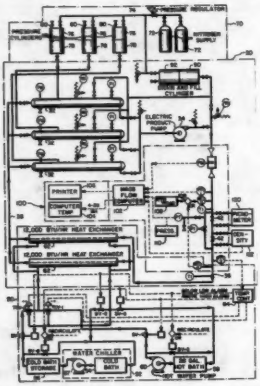
onto a correspondingly shaped arcuate member mounted on a framework, disposing a framework mounted die having a groove of a shape corresponding to that of the edge area of a rib proximate one of said openings over said edge area, heating said edge area surrounding said one of said openings to a molten state, selectively extending a rigid one piece guide pin within said one of said openings after the surrounding area is in said molten state, moving said die into engagement with said edge area, and withdrawing said die and said guide pin after opening resizing is accomplished.

4,570,476

DENSITOMETER PROVING SYSTEM

Garland H. Davis, Tulsa, Okla., assignor to Santa Fe Pipeline Company, Tulsa, Okla.

Filed Mar. 29, 1984, Ser. No. 594,757
Int. Cl.[4] G01N *9/04;* G01D *18/00*
U.S. Cl. 73—1 R **15 Claims**



1. A densitometer proving system comprising:
means for repeatedly recirculating at least one high vapor pressure product through a closed circuit;
means for connecting a densitometer calibration device to the closed circuit such that said at least one product flows through the calibration device;
means for connecting a densitometer to the closed circuit such that said at least one product flows through the densitometer, said densitometer operative to generate a signal indicative of the density of the at least one product;
means for adjustably controlling the temperature of said at least one product in the closed circuit at a selected temperature chosen from a predetermined range of temperatures;
means for adjustably controlling the pressure of said at least one product in the closed circuit at a selected pressure chosen from a predetermined range of pressures; and
means, responsive to the signal, for displaying information indicative of the density of the at least one product measured by the densitometer.

4,570,477

LEAK DETECTING CABLE

Hiroyuki Sugibuchi, Hoya, Japan, assignor to Junkosha Company Ltd., Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,371
Claims priority, application Japan, Mar. 10, 1983, 58-34500[U]
Int. Cl.[4] G01M *3/16*
U.S. Cl. 73—40.5 R **2 Claims**

1. A liquid detection sensor having an elongated body comprising inner and outer conductors arranged so as to be in a substantially coaxial and parallel relationship, said inner conductor being a linear solid body and said outer conductor being a cylindrical reticulate body, and having an insulating layer of a fluororesin provided between said inner and outer conductors, the outer circumferential surface of said outer conductor being covered with an outer protective covering layer of a porous material, the outer protective covering layer comprising a first sub-layer covering the outer circumferential surface

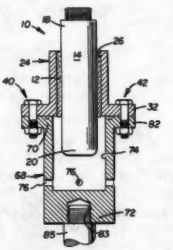
of said outer conductor and a second sub-layer covering the outer circumferential surface of said first sub-layer, and having at least one linear metallic plastically and permanently deformable member of metallic lead or an alloy thereof embedded in said sensor between said first and said second sub-layers, extending along at least a portion of said body's longitudinal direction.

4,570,478

CONCENTRIC-CYLINDER RHEOMETER

David S. Soong, Albany, Calif., assignor to The Regents of The University of California, Berkeley, Calif.

Filed Apr. 8, 1985, Ser. No. 721,153
Int. Cl.[4] G01N *11/10*
U.S. Cl. 73—60 **6 Claims**

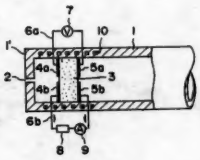


1. A rheometer (10) comprising:
a central cylinder (14) having an axis (16), a first end (18) and a second end (20);
a tube (24) having a cylindrical bore (26), said bore (26) being slightly larger than said cylinder (14) and being positioned thereabout and coaxial therewith, said tube (24) having a first open end (28) and a second open end (30) aligned toward, respectively, said first end (18) and said second end (20) of said cylinder (14);
a loading cup (44) having a first end portion (46), a second end portion (48), an interior cylindrical opening (50) larger than said bore (26) and extending from said first end portion (46) toward said second end portion (48), said first end portion (46) of said cup (44) being detachably attachable to said second open end (30) of said tube (24) with said cylindrical opening (50) generally coaxial with said bore (26);
axial moving means (34) for controllably axially moving said tube (24) relative to said cylinder (14); and
measuring means (84) for measuring instantaneous force exerted on said cylinder (14) as said tube (24) moves axially.

4,570,479
AIR-FUEL RATIO DETECTOR AND METHOD OF MEASURING AIR-FUEL RATIO

Shigenori Sakurai; Takashi Kamo, and Tadayoshi Ikai, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 3, 1984, Ser. No. 576,955
Claims priority, application Japan, Jul. 25, 1983, 58-135525
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 73—116 **9 Claims**

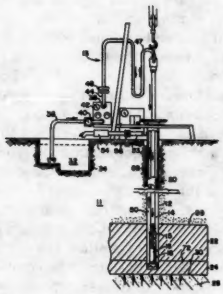


1. An air-fuel ratio detector for detecting oxygen density in exhaust gas emitted from an engine, comprising:
a DC power supply;
a circuit for detecting an electromotive force;
a tubular body;
first and second partition members hermetically contacting an inner peripheral surface of said tubular body transversely of an axis of said tubular body wherein said first partition member further comprises a solid electrolyte permeable to oxygen ions;
gas dispersion means operatively associated with said solid electrolyte for communicating said gas to said solid electrolyte;
first and second pairs of spaced apart gas-permeable thin-film electrodes separately mounted on opposite sides of said solid electrolyte, said first pair of electrodes being connected to said circuit for detecting an electromotive force and said second pair of electrodes being connected to said DC power supply.

4,570,480
METHOD AND APPARATUS FOR DETERMINING FORMATION PRESSURE

John E. Fontenot, and Richard D. Murphy, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,320
Int. Cl.⁴ E21B *47/06, 49/00*
U.S. Cl. 73—155 **15 Claims**

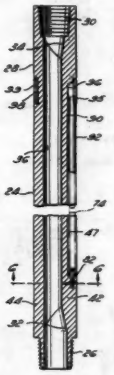


8. Apparatus for determining the pressure of a formation being traversed by a borehole during drilling thereof by a drill string comprising:
a. a drill string for insertion into said borehole;
b. a means for reducing the fluid pressure in said borehole by withdrawing said drill string at a predetermined velocity;
c. a pressure measurement means responsive to said pressure reducing means; and
d. means for detecting influx of fluids from said formation into said borehole.

4,570,481
INSTRUMENT LOCKING AND PORT BUNDLE CARRIER

Lauchlin A. McLaurin, Houston, Tex., assignor to V.E. Kuster Company, Long Beach, Calif.

Filed Sep. 10, 1984, Ser. No. 648,685
Int. Cl.⁴ E21B *49/00*
U.S. Cl. 73—152 **8 Claims**



1. A bundle carrier for insertion in a drill string carrying a bundle of well logging instruments during drilling operations, comprising:
a generally cylindrical body;
a longitudinal slot formed in the outer surface of the body for receiving an instrument bundle;
means for engaging a first end of the instrument bundle to retain it in the slot;
a jig for engaging a second end of the instrument bundle; and
a retaining ring having a notch therein for selective alignment with the slot for admitting a portion of the jig therethrough, the retaining ring being rotatable upon the body to misalign the slot and notch to retain the jig and instrument bundle in the slot.

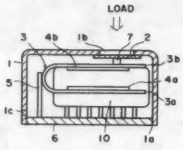
4,570,482
LOAD-SENSITIVE LEVEL DETECTING DEVICE

Michihiro Murata, Kyoto, and Akira Kumada, Ootsu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 19, 1983, Ser. No. 486,371
Claims priority, application Japan, Apr. 23, 1982, 57-69388; May 21, 1982, 57-86923
Int. Cl.⁴ G01F *23/00*
U.S. Cl. 73—290 V **6 Claims**

1. A load sensitive level detectng device for detecting the level of a material in powder or liquid form, said device comprising:
a piezoelectric vibrator including a U-shaped piezoelectric tuning fork having first and second vibrating legs and a base section connecting said legs, said tuning fork being mechanically supported at said base section;
isolating means for isolating said piezoelectric tuning fork from the material whose level is being detected, said isolating means being exposed to said material and being connected to said tuning fork at said second vibrating leg

whereby said isolating means mechanically dampens the vibration of said second vibrating leg when a load is applied to said isolating means by said material; and



means for exciting said first vibrating leg so as to cause said first vibrating leg to vibrate and for detecting the vibration of said second vibrating leg so as to determine if the vibration of said second vibrating leg is being dampened by said material.

4,570,483

PIEZO-ELECTRIC LEVEL SENSOR FOR INTERNAL COMBUSTION ENGINE

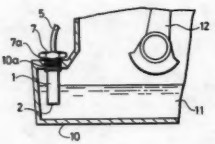
Hideo Sobue, Aichi, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 25, 1984, Ser. No. 634,366

Claims priority, application Japan, Jul. 26, 1983, 58-115877[U]; Aug. 5, 1983, 58-122421[U]

Int. Cl.⁴ G01M *15/00*

U.S. Cl. 73—290 V **5 Claims**



1. A sensor assembly for detecting the level of oil in the crankcase of an internal combustion engine, said assembly comprising:

(a) a level sensor having a generally tubular body and an end closure comprised of a thin metal plate affixed to one end of said tubular body, the outer surface of said plate being disposed to contact the oil to be detected, the inner surface of said plate having a piezo-electric element bonded thereto;

(b) means for electrically connecting output means to said piezo-electric element; and

(c) means for affixing said level sensor through a wall of said crankcase such that said outer surface of said plate is generally perpendicular to the surface of the oil in said crankcase.

4,570,484

LIQUID MEASUREMENT SYSTEM

Robert G. Sokalski, Wheaton, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 18, 1985, Ser. No. 713,051

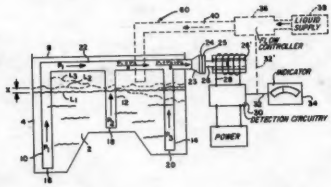
Int. Cl.⁴ G01F *23/14*

U.S. Cl. 73—301 **9 Claims**

1. A system for providing an averaged measurement of a liquid contained within an irregular shaped region in suitable units of measurement, said system comprising:

non-contacting movable sensor means at an end of a fluid conduit and providing a continuous electrical output signal in response to variations in an averaged liquid pressure signal received thereby, said sensor means of the type comprising an eddy current transducer operable to provide said electrical output signal in response to movement of a metallic armature within an electromagnetic field of a coiled current carrying conductor in response to movement of a pressure responsive diaphragm at an end of said fluid conduit upon exposure to said liquid pressure variations,

indicator means for indicating said averaged liquid measurement, said indicator means operative to receive said sensor means electrical output signal and convert said output signal to said averaged liquid measurement, and



a plurality of conduit means operative to convey a liquid pressure signal respectively therethrough, said conduit means having respective ends thereof disposed in said liquid within said region in a spaced-apart array predetermined to provide a plurality of liquid pressure signals accounting for the region shape irregularities, said conduit means having respective opposite ends thereof joined together in fluid pressure communicating relationship with said fluid conduit and operative to combine said plurality of liquid pressure signals to provide said averaged fluid pressure signal for exposure to said diaphragm.

4,570,485

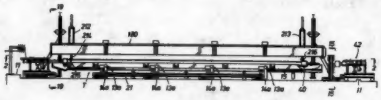
METHOD OF AND APPARATUS FOR THE HYDROSTATIC TESTING OF THREADED PIPE

Roy Lee, Jr., 10134 Briar Dr., Houston, Tex. 77042

Filed Mar. 7, 1983, Ser. No. 472,717

Int. Cl.⁴ G01M *3/28*

U.S. Cl. 73—49.5 **10 Claims**



8. Hydrostatic testing apparatus for threaded pipe comprising a test rack for supporting the pipe to be tested, a first threaded end cap for closing one end of the pipe, means for moving the pipe and first end cap into position to make-up a threaded connection between the threaded end cap and the threaded end of the pipe, means to rotate the end cap to make-up the connection, said means including an elongated mandrel attached to the first end cap and extending along the longitudinal axis of the first end cap, a socket positioned to receive the mandrel and form a driving connection therebetween, and means to rotate the socket to rotate the first end cap to make-up and break-out the threaded connection between the first end cap and the pipe, a second end cap, means for moving the pipe longitudinally with the first end cap attached to move the mandrel out of the socket and to position the other end of the pipe and the second end cap in position to be connected, means for rotating the second end cap to make-up the threaded connection between the pipe and the second end cap, means for testing the pipe with water under pressure supplied through one of the end caps when both ends of the pipe are closed by the caps, means for breaking-out the threaded connection between the pipe and the second end cap, means for moving

the pipe longitudinally to insert the mandrel into the socket, and means for rotating the socket to break-out the first end cap.

4,570,486

ULTRASONIC THICKNESS GAUGE CIRCUIT WITH TRANSIT PATH CORRECTION

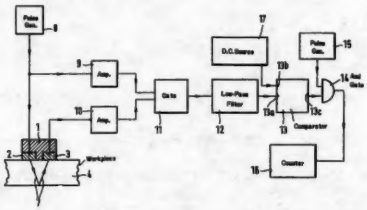
Klaus Volkmann, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Krautkramer-Branson, Inc., Lewistown, Pa.

Filed Nov. 14, 1984, Ser. No. 671,203

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401144

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **2 Claims**



1. A circuit for correcting the sonic transit path error when measuring the wall thickness of a workpiece by the use of ultrasonic probes using a dual transducer probe having a transmit transducer for transmitting ultrasonic pulses into the front surface of a workpiece whose thickness is to be measured and having a spaced receive transducer for receiving the ultrasonic pulses after reflection at the rear surface of the workpiece and including a gate logic element coupled to said transducers for producing primary square wave signals the duration of which is proportional to the transit time of the ultrasonic pulses in the workpiece; an AND gate; a pulse generator coupled to one input of said AND gate for providing at the output of said AND gate counting pulses during the time interval during which said AND gate provides secondary square wave signals, and a pulse counter coupled to the output of said AND gate for counting the pulses from said pulse generator passed through said AND gate, the improvement comprising:

the series connection of a low-pass filter and a comparator coupled between said gate logic element and said AND gate wherein the output of said gate logic element is coupled to the input of said filter and the output of said filter is coupled to one input of said comparator, and the output of said comparator is coupled to the other input of said AND gate;

a source of direct current voltage coupled to the other input of said comparator, and

the time constants of said low-pass filter being selected to cause the ratio of the duration of the secondary square wave signals produced at the output of said comparator and causing operation of said AND gate to the duration of said primary square wave signals produced at the output of said gate logic element to be proportional to the ratio of the wall thickness of the workpiece to the transit time of the ultrasonic pulses in the workpiece.

4,570,487

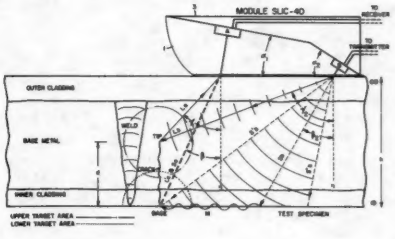
MULTIBEAM SATELLITE-PULSE OBSERVATION TECHNIQUE FOR CHARACTERIZING CRACKS IN BIMETALLIC COARSE-GRAINED COMPONENT

George J. Gruber, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of Ser. No. 268,145, May 28, 1981, Pat. No. 4,435,984, which is a continuation-in-part of Ser. No. 142,216, Apr. 21, 1980, Pat. No. 4,299,128. This application Mar. 12, 1984, Ser. No. 588,898

Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—624 **40 Claims**



1. An ultrasonic test method of determining the depth of a flaw in a test specimen from a single examination surface of said test specimen comprising:

transmitting into said test specimen by means of a first transducer a first incident wave directed at an upper target area within said test specimen;

receiving from said upper target by means of a second transducer located on the same side of said target area as said first transducer and having a different angular orientation to said examination surface than said first transducer a first returned wave and converting said first returned wave to a first signal;

transmitting into said test specimen by means of said first transducer a second incident wave directed at a lower target area located below said upper target area;

receiving from said lower target area by means of said second transducer a second returned wave and converting said second returned wave to a second signal;

simultaneously displaying by means of a display unit said first and second signals;

moving said first and second transducers along said examination surface;

recognizing said first and second signals as comprising a doublet of associated signals from a flaw located in said upper and lower target areas if, upon movement of said first and second transducers, said first signal's sequence of arrival remains prior to said second signal's sequence of arrival and the first separation comprised of the difference between said first signal's time of arrival and said second signal's time of arrival is substantially independent of the distance between said upper and lower target areas and said first and second transducers;

measuring said first separation;

determining said flaw's depth by using said first separation as a proportional indicator of flaw depth.

4,570,488
ULTRASONIC SECTOR-SCAN PROBE

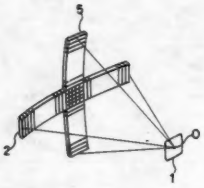
Hirohide Miwa, Kawasaki; Hajime Hayashi, Yamato; Takai Shimura, Machida; Tadahiko Yanashima, Fujisawa; Kenji Kawabe, and Atsuo Iida, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 476,720, Mar. 18, 1983, abandoned. This application Jun. 7, 1984, Ser. No. 618,232

Claims priority, application Japan, Mar. 20, 1982, 57-45395; Mar. 20, 1982, 57-45396

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—626 **12 Claims**



1. An ultrasonic sector-scan probe comprising:

two linear arrays of respective pluralities of ultrasonic transducer segments, said two linear arrays being oriented transversely to each other;

a window for transmitting and receiving ultrasonic waves with said segments;

an ultrasonic wave propagation medium filled in a front room between said arrays and the window;

means for selectively activating respective groups of the ultrasonic transducer segments of each said linear array with respective relative phases, thus defining a respective aperture for each said group, wherein the ultrasonic waves emitted from each said group of each said linear array are formed into a respective beam for transmission along a respective scanning line to a subject under test held in contact with the exterior of said window, and respective reflected waves from the subject are received through the window, so that by changing at least in part the segments to activate different ones of said groups the beams are shifted to respective angles corresponding to said scanning lines to define two transverse scanning planes respectively corresponding to said two linear arrays;

wherein the scanning lines corresponding to said groups intersect substantially at a point in the vicinity of said window as a result of the relative positions of the respective transducer segments and the relative phases of activating the ultrasonic transducer segments of each said group, to perform sector scanning in two respective sections.

4,570,489
APPARATUS FOR DETECTING THE EVOLUTION OF AN ACOUSTIC SIGNAL

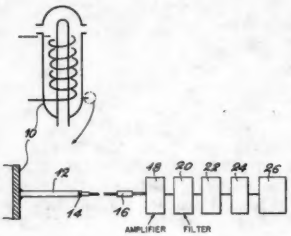
Alain Baumaire, Paris; Thierry Desmas, Montigny le Bretonneux, and Guy Vambenepe, Rueil Malmaison, all of France, assignors to Service National Electricite de France, Paris, France

Filed Jul. 14, 1983, Ser. No. 513,607

Int. Cl.[4] G01M *3/24*

U.S. Cl. 73—658 **3 Claims**

1. An apparatus for the detection of the sudden evolution of an acoustic signal received by acoustic sensors placed on a member, said acoustic sensors supplying an electrical signal, wherein said apparatus comprises a circuit for measuring the effective value of the signal supplied by the sensors and an electronic circuit for analyzing this effective value, wherein the analysis circuit comprises a circuit for smoothing the effective value of the signal, a sawtooth signal generator, an adder receiving the smoothed signal and the sawtooth signal and supplying a notched signal formed by the sum of said smoothed and sawtooth signals, a circuit receiving the smoothed signal and able to output a signal in the form of linear segments best approximating the smoothed signal, a test circuit connected to the adder supplying the notched signal and to the circuit supplying the linear segments, said test circuit being able to analyze the arrangement of the notched signal with respect to the signal in the form of linear segments with the aid of a sequence test, and a comparator connected to the test circuit and able to compare the result of the analysis with a predetermined threshold.



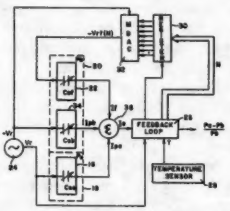
4,570,490
DIFFERENTIAL PRESSURE RATIO MEASUREMENT SYSTEM

Frank J. Antonazzi, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 280,578, Jul. 6, 1981. This application Jul. 25, 1983, Ser. No. 505,142

Int. Cl.[4] G01L *9/12*

U.S. Cl. 73—701 **4 Claims**



1. A differential pressure ratio measuring system comprising:

means for generating first and second alternating reference signals having a predetermined phase relationship therebetween;

a first pressure sensitive impedance; responsive to a first pressure and driven by said first reference signal, for generating a first signal proportional to the change in said first pressure;

a second pressure sensitive impedance, responsive to a second pressure and driven by an alternating feedback signal, for generating a second signal proportional to the change in the second pressure;

a third pressure sensitive impedance, responsive to at least one of said first and second pressures and driven by said second reference signal, for generating a third signal proportional to at least one of said first and second pressures;

means, electrically connected to said first, second, and third impedances, for generating an error signal as the combination of said first, second, and third signal; and

means for converting said error signal into a digital number including means for integrating said error signal and gen-

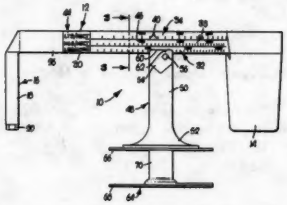
erating a digital output number therefrom representative of the ratio of the difference of said first and second pressure to the first pressure, digital-to-analog converter means for converting said digital number to an analog signal, and means for multiplying said analog signal by said second reference signal to generate said feedback signal, wherein said feedback signal is fed to said second impedance means to generate said second signal and null said error signal.

4,570,491

RATE METER AND METHOD OF DETERMINING DISTRIBUTION RATES

Cecil B. Machnee, Yorkton, Canada, assignor to Morris Rod Weeder Co. Ltd., Yorkton, Saskatchewan, Canada

Filed Sep. 4, 1984, Ser. No. 647,167
Int. Cl.[4] G01F *1/00*
U.S. Cl. 73—861 **16 Claims**



2. For use with a fulcrum having an upper edge, a rate measuring device for determining the output of a material-dispensing machine comprising:

a beam;

means connected to the beam for support of a sample of material, said sample having a weight equal to the weight of the material distributed upon a known quantity of area;

a bottom on the beam having a number of fulcrum-engageable positions;

at least one graduated scale connected to the beam; and

numerals marking at least a portion of at least one of the scales and cooperatively associated with said fulcrum-engageable positions, such that when the fulcrum engages the bottom in a position to exclusively carry and horizontally balance the beam, the numerals associated with that position indicate the weight of material distributed per a unit quantity of area, wherein said unit quantity of area is different from said known quantity of area.

4,570,492

ELECTROCHEMICAL FLOWMETER

Myles A. Walsh, 60 Barnabas Rd., Falmouth, Mass. 02540

Filed Oct. 1, 1984, Ser. No. 655,744
Int. Cl.[4] G01P *5/18*
U.S. Cl. 73—861.05 **4 Claims**

1. A flowmeter for measuring the relative velocity of liquid flow therepast, said meter including:

a chemical emitting electrode means, arranged to contact said liquid and to generate one or more chemicals by electrochemical reactions with said liquid,

a chemical detecting electrode means, arranged to contact said liquid downstream of said chemical emitting electrode means and to consume by electrochemical reactions said chemical(s) earlier generated by said chemical emitting electrode means,

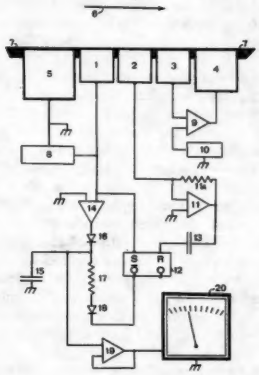
a reference electrode, arranged to contact said liquid,

a counter electrode means, arranged to contact said liquid,

a second counter electrode means, arranged to contact said liquid,

a current source for periodically applying a current to said chemical emitting means,

a potentiostatic circuit for maintaining the voltage of said chemical detecting means essentially constant with respect to said reference electrode, and containing a current-to-voltage converter for producing a voltage rise on the



arrival of chemical(s) earlier produced by said chemical emitting means,

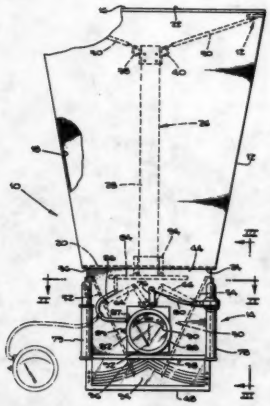
and means connected to said periodic current source and said potentiostatic circuit for measuring the time between an input current pulse and the corresponding output voltage rise.

4,570,493

VARIABLE ORIFICE AIR FLOW MEASURING DEVICE AND METHOD

Louis J. Leemhuis, 311 Promontory Dr. W., Newport Beach, Calif. 92660

Filed Mar. 11, 1985, Ser. No. 710,081
Int. Cl.[4] G01F *1/42, 1/46*
U.S. Cl. 73—861.62 **8 Claims**



1. A device adapted for use in measuring the volume of air flowing into or out of an air conditioning duct comprising:

a hood having a top end which defines a first orifice adapted to cover said air conditioning duct to provide channeling

of said air flow from said air conditioning duct into said device, said hood further including side walls and a bottom end which defines a second orifice;

an air flow measurement housing having an open top end, side walls and an open bottom end, said air flow measurement housing defining an air flow channel having a cross-sectional area;

means for connecting the bottom end of the hood to the top end of the air flow measurement housing;

means for controllably varying the cross-sectional area of said air flow channel comprising first and second vanes located within said air flow channel, said vanes being moveable between an open position where said vanes are substantially parallel to the housing side walls so that air flow through said channel is not restricted and a closed position where the vanes are positioned to restrict the cross-sectional area of said air flow channel to substantially zero and wherein said first vane includes a top end hingedly mounted to said housing side wall and a second end, said second end being located adjacent said housing side wall at said open position and displaced centrally within said air flow channel at said closed position and said second vane includes a top end hingedly mounted on said housing wall on the opposite side of said air flow channel from said first vane, said second vane having a bottom end which is located adjacent said housing wall at said open position and displaced centrally within said air flow channel at said closed position;

means for measuring the velocity pressure of air flow through said air flow channel; and

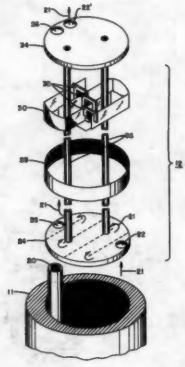
calibration means for correlating the cross-sectional area of said air flow channel with the velocity pressure of air flow through said channel to provide a measurement of the volume of air flowing through said air flow channel which thereby provides a measurement of the volume of air flowing into or out of said air conditioning duct.

4,570,494

APPARATUS FOR SAMPLING AND CHARACTERIZING AEROSOLS

Patrick F. Dunn, Downers Grove; Joseph E. Herceg, Naperville, and Robert H. Klocksieben, Park Forest, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 11, 1984, Ser. No. 599,110
Int. Cl.[4] G01N *1/22*
U.S. Cl. 73—863.22 **10 Claims**



1. Apparatus for sampling aerosols comprising:

a chamber having an inlet at one end and an outlet at the other end, said chamber including:

a plurality of vertically stacked, successive particle collection stages located within said chamber between said chamber inlet and chamber outlet and together with said chamber, defining a flow path from said chamber inlet, through successive collection stages, to said chamber outlet, each of said collection stages including:

a separator plate located within and extending across said chamber for separating that stage from the previous stage, said separator plate having an inlet opening extending therethrough, and

a channel guide, mounted transverse to said separator plate, defining a labyrinthine flow path from said inlet opening to the inlet opening of the next stage, and

a plurality of particle collection means supported by said channel guide and located within said labyrinthine flow path;

the particle collection means within the plurality of collection stages of the chamber including a combination of

collector plates for gravity separation,

fine wire impactors, and

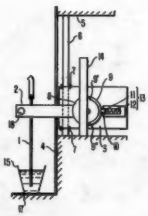
diffusion battery screens.

4,570,495

APPARATUS FOR DRAWING LIQUID SAMPLES INTO A LIQUID TESTING MACHINE

Kunio Terada, Kyoto, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed May 18, 1984, Ser. No. 612,028
Claims priority, application Japan, Jun. 4, 1983, 58-86890[U]
Int. Cl.[4] B07L *3/02*; G07N *35/06*
U.S. Cl. 73—864.25 **11 Claims**



1. An apparatus for drawing liquid samples and the like, comprising:

a base;

a vertically extending guide rail fixed to said base;

a movable support member slidably mounted on said guide rail for vertical movement therealong between a lower position and an upper position above said lower position;

means for blocking movement of said movable support member above said upper position;

a probe for guiding therethrough the samples or the like;

an arm holding said probe at one end thereof;

a pivot member, including an arciform guide, fixed to the other end of said arm, pivotally mounting said arm to said movable support member for pivotal movement about a horizontal axis;

a fixed support member positioned and arranged to engage said arciform guide so as to vertically support said arm when said movable support member is at said upper position and said arm is pivoted upward; and

means, including a detent mechanism vertically movable with said movable support member and elastically engagable with said pivot member, for releasably holding said arm in a first predetermined inclination;

said arm being positioned and arranged so as to be pivotable upward in a plane from said first predetermined inclination toward a second predetermined inclination against the elastic force of said detent mechanism acting on said pivot member so as to bring said arciform guide into a position where it is vertically supported by said fixed

support member, when said movable support member is in said upper position.

4,570,496

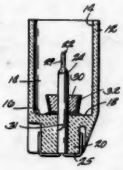
MOLTEN METAL SAMPLER WITH TELLURIUM ADDITIVE

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Oct. 3, 1983, Ser. No. 538,149

Int. Cl.[4] G01N *1/10;* G01K *13/12*

U.S. Cl. 73—864.58 8 Claims



1. A molten metal sampler cup comprising side wall means defining a receptacle for molten metal, wall means defining a base and connector plug, a heat sensing element, a bore through the base for receiving a protective tube for the heat sensing element which projects into said receptacle, and a tellurium insert unit having a measured amount of tellurium formed in an annular shaped form, said unit being arranged around the heat sensor and spaced from at least said side wall means, and means for securing the tellurium insert unit in the interior of said cup.

4,570,497

DOUBLE CASING WATER METER

Eui M. Han, Seoul, Rep. of Korea, assignor to Shinhan Kongki Co. Ltd., Incheon, Rep. of Korea

Filed May 7, 1984, Ser. No. 607,678

Claims priority, application Rep. of Korea, Jun. 24, 1983, 2860/1983

Int. Cl.[4] G01F *1/05*

U.S. Cl. 73—861.79 3 Claims

1. A double casing water meter comprising:

an inlet port and an outlet port, a water chamber, an inner lower casing having a circular bottom plate with one or more water inflowing holes and one or more water inflowing tubes in fluid communication with said water inflowing holes and a cylindrical wall with one or more water discharging holes, and a vane wheel with a plurality of vane blades mounted within said inner lower casing, wherein each of said vane blades has a concave portion with an inclined surface perpendicular to the longitudinal axis of said water inflowing tubes, characterized in that the water inflowing from said inlet port flows via said water chamber and through said water inflowing tubes into said inner lower casing, the inflowing water thereby running against said concave portion and at the same time against said inclined surfaces of said vane blades, at a right angle to generate turning force on said vane wheel, and flows out via said water discharging holes and through said outlet port.

4,570,498

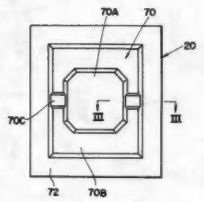
DIFFERENTIAL PRESSURE MEASURING TRANSDUCER ASSEMBLY

Tsutomu Okayama, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,190

Int. Cl.[4] G01L *7/08*

U.S. Cl. 73—720 6 Claims



1. A differential pressure measuring transducer assembly comprising:

a housing;

a measuring diaphragm of semiconductor material mounted in said housing composed of a pressure receiving section producing a displacement when pressure is applied, and a stationary section located at an outer periphery of the pressure receiving section;

means for causing a pressure of a fluid under pressure to act on the measuring diaphragm to measure the pressure;

the pressure receiving section of the measuring diaphgram comprising at least one large thickness portion, and at least one small thickness portion, said at least one large thickness portion including a rigid body portion of large thickness located in a central portion and a plurality of strain producing portions in the form of beams located between the rigid body portion and the stationary section at the outer periphery of the pressure receiving section, said at least one small thickness portion including a small thickness portion located at an outer periphery of the rigid body portion, said strain producing portions in the form of beams having a thickness smaller than that of said rigid body portion and greater than that of the small thickness portion; and

a gauge resistance provided in the vicinity of the large thickness portion.

4,570,499

SWING BRIDGE

Helmut Dürr, Frankfurt am Main, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Apr. 10, 1984, Ser. No. 598,898

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315642

Int. Cl.[4] F16H *21/22*

U.S. Cl. 74—44 5 Claims

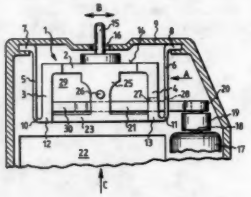
1. A device for converting rotary motion of an eccentric driven by a shaft into reciprocating motion of a working tool connectable to a power drive in a powered appliance including a housing comprising:

a swing bridge member having a substantially planar bridge yoke portion coupled to the power drive;

a first and second wall, each having a free end, projecting at approximately right angles from said bridge yoke portion, said first and second walls forming a rigid unit with said

bridge yoke portion for reciprocating movement therewith, said first wall including a wall aperture;

first and second flexible hinge members each having a first and second end, said first end of said first hinge member connected to said free end of said first wall and said first end of said second hinge member connected to said free end of said second wall, said second ends of said first and second hinge members being connectable to the housing



of the powered appliances, said first flexible hinge member including a hinge aperture; and

a connecting rod having a first end connectable with the eccentric and a second end connected to said swing bridge member, said connecting rod being aligned parallel to said planar bridge yoke portion and positioned through said wall aperture of said first wall and through said hinge aperture of said first flexible hinge portion.

4,570,500

MECHANISM FOR CONTROLLING THE OPERATION OF MACHINES

Robert A. Richter, 12262 Harbor Blvd., Garden Grove, Calif. 92640

PCT No. PCT/US79/01158, § 371 Date Dec. 4, 1981, § 102(e) Date Dec. 4, 1981, PCT Pub. No. WO81/01871, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 31, 1979, Ser. No. 448,892

Int. Cl.⁴ F16H *25/14, 53/08*

U.S. Cl. 74—54 **6 Claims**

1. A mechanism for controlling the operation of machines comprising:

(a) a cam having a recessed idle area and having at least one recessed cycloidal work groove where the ends of the work groove intersect the idle area;

(b) the idle area consists of having a circular idle well centrally located on said cam and having a bore centrally located within the idle well and extending therethrough;

(c) the work groove consists of having a single cycloidal work groove located outside the periphery of the idle well;

(d) means for rotating said cam;

(e) a cam follower engaged alternately in the idle area or the work groove;

(f) an escapement guide consisting of a device having at least one glide surface, where the glide surface is located at an entry intersection of the idle area and a cycloidal work groove, and where said escapement guide is selectively positionable whereby, when placed in an idle mode position said cam follower clears the glide surface and remains in the idle area and when placed in a work mode position said cam follower strikes the glide surface causing said cam follower to slidably leave the idle area and transfer into a work groove;

(g) said escapement guide is a single-glide-surface escapement guide consisting of a plate with a glide-surface located on side of plate, and a perpendicular push-rod extending from the backside of the plate, and where the plate is located within the idle well with the rod extending through the bore in the idle well, and where said escapement guide is radially fixed with respect to cam face and axially movable whereby, when said escapement guide is in a retracted position said cam follower clears the glide surface and remains in the idle well, and when said escapement guide is in an extended position said cam follower strikes the glide surface causing said cam follower to slidable leave the idle well and transfer into the work groove;

(h) means for maintaining said escapement guide in a fixed radial position; and

(i) means for axially extending and retracting said escapement guide

(j) means for selectively positioning said escapement guide; and

(k) a work shaft connected on one end to said cam follower and where other end operates a machine.

4,570,501

TRANSMISSION UNITS OF TOROIDAL RACE ROLLING FRICTION TYPE

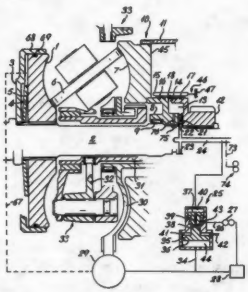
Forbes G. de Brie Perry, Charlbury, England, assignor to National Research Development Corporation, London, England

Filed Jun. 23, 1983, Ser. No. 507,035

Claims priority, application United Kingdom, Jun. 23, 1982, 8218172

Int. Cl.⁴ F16H *15/38, 17/06*

U.S. Cl. 74—200 **13 Claims**



1. A toroidal race rolling traction transmission having structural parts including an input disc and an output disc mounted to rotate in opposite directions about a common axis and rollers providing a driving connection between said disc, and also including:

hydraulic actuation means including a variable capacity chamber and operable in use to urge said input and output discs towards each other, said chamber comprising first and second defining parts;

said first part of said chamber being connected to said input disc so as to rotate about said common axis in the same direction as said input disc;

said second part of said chamber being connected to said output disc so as to rotate about said common axis in the

same direction as said output disc and thus in contra-rotation to said first part;

said first and second parts of said chamber being separated by a gap a dimension of which lies parallel to said common axis, and having elements capable of limited movement in a direction also parallel to said common axis;

an annular rubbing sealing member coaxial with said common axis which seals said gap, said sealing member being fixed to a structural part of said transmission other than said input disc and said output disc, whereby, in use, said sealing member rotates about said common axis at a speed, including zero absolute speed, intermediate that of said first and second parts of said chamber.

4,570,502

GEARSHIFT LEVER ARRANGEMENT TO CONTROL THE SPEED OF SHIFTING GEARS IN POWER-ASSISTED TRANSMISSION

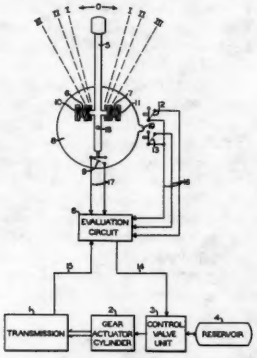
Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hannover, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,443

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238219

Int. Cl.⁴ B60K *20/02*

U.S. Cl. 74—335 **8 Claims**



1. A gearshift arrangement for controlling the speed at which the gears of a power-assisted transmission are shifted into engagement comprising:

(a) power-actuator means for effecting said shifting of said gears;

(b) shift command generator means for selecting the shifting of said gears at either a normal speed or at a faster-than-normal speed;

(c) evaluation means for monitoring said shift-command generator means to determine the selected gearshifting speed; and

(d) valve means subject to said evaluation means for controlling said power-actuator means so as to effect said shifting of said gears at the speed selected by said gearshift means.

4,570,503

COUNTERSHAFT TRANSMISSION

Michael R. Theobald, Princeville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 17, 1984, Ser. No. 651,017

Int. Cl.⁴ F16H *3/08*

U.S. Cl. 74—360 **15 Claims**

6. A countershaft transmission comprising:

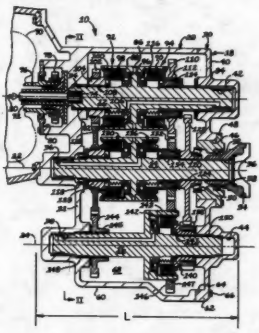
an input shaft having first and second gears freely rotatably mounted thereon;

first clutch means for selectively connecting the first gear to the input shaft;

second clutch means for selectively connecting the second gear to the input shaft;

an output shaft having a third gear and an eighth gear freely rotatably mounted thereon and a fourth gear mounted for joint rotation therewith:

third clutch means for selectively connecting the third gear to the output shaft;



fourth clutch means for selectively connecting the eighth gear to the output shaft;

a third shaft having a fifth gear freely rotatably mounted thereon, and a sixth gear and a seventh gear mounted for joint rotation therewith; and

fifth clutch means for selectively connecting the fifth gear to the third shaft, the first gear intermeshingly engaging the third gear, the second gear intermeshingly engaging the seventh gear, the third gear intermeshingly engaging the sixth gear, the fourth gear intermeshingly engaging the fifth gear, and the seventh gear intermeshingly engaging the eighth gear.

4,570,504

AUTOMATICALLY DISENGAGEABLE GEARING

Jaroslav Sitta, and Antonin Schiebl, both of Zabreh na Morave, Czechoslovakia, assignors to Zavody silnoproude elektrotechniky koncern Praha MEZ Mohelnice, koncernovy podnik, Mohelnice, Czechoslovakia

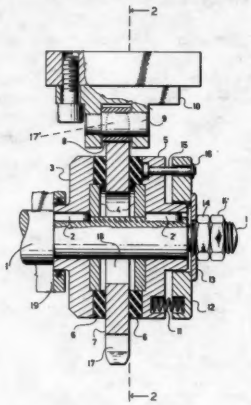
Filed Sep. 27, 1983, Ser. No. 536,244

Int. Cl.⁴ F16H *57/10*

U.S. Cl. 74—411 **4 Claims**

1. A mechanism for automatically engaging and disengaging two successive gears in a gear train, each of said gears having a plurality of teeth thereon, a first one of said gears being so constructed and arranged that the teeth thereon travel in a path fixed in space, the second of said gears being a pinion, means for mounting said pinion for movement radially thereof into meshing engagement with the first gear and for moving out of mesh with the first gear, a shaft, the pinion having a large central opening therethrough through which the shaft extends, said central opening in the pinion having a diameter such that it exceeds the diameter of the shaft by at least twice the radial height of the teeth on the pinion, friction means disposed to engage a side of the body of the pinion and drivingly connected to the shaft, and resilient means thrusting the friction means toward the pinion whereby the drive the pinion by the shaft, the engaging driving surfaces of the meshing teeth on the first and second gears being such that when the gears are in

mesh and a driving force exists between the meshing teeth of the first and second gears, a radial force tending to thrust the



second gear to a position eccentric of the shaft is exerted upon the second gear by at least one of the teeth of the first gear.

4,570,505

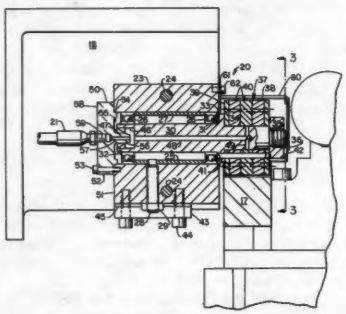
RACK LUBRICATOR

David A. Peterson, Milford, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 6, 1984, Ser. No. 597,515

Int. Cl.[4] F16H *57/04, 1/04;* **F16N** *7/12, 7/24*

U.S. Cl. 74—467 **9 Claims**



1. In a machine having first and second machine members movable with respect to one another, wherein a toothed rack is affixed to the first member and a mating toothed gear is rotatably carried by the second member in mesh with said rack, an improved rack lubricator, comprising:

(a) a housing;

(b) a bearing in said housing;

(c) a shaft rotatably supported in said bearing;

(d) a toothed relatively soft porous gear member having a uniform tooth profile, cooperatingly formed to, and engageable with, said toothed rack, said porous gear member rotatably carried by one of said shaft and housing as the other of said shaft and housing is fixed to said second member;

(e) rotary fluid manifold means for ducting fluid from a non-rotating fluid line to said porous gear member; and

(f) a toothed relatively firm end plate rotatably carried with, and held adjacent to, said porous gear member, said end plate having the same tooth profile of said gear member.

4,570,506

OPERATING WIRE CONTROL DEVICE FOR A BRAKE SYSTEM

Sadashi Yamamoto, No. 1832, Shimoniikura, Wako-shi, Saitama; Hiroaki Kayama, No. 10-17, Honcho, Sakado-shi, Saitama, and Masaki Watanabe, No. 5-3-25, Tsuji, Urawa-shi, Saitama, Japan

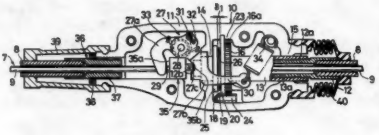
Filed Feb. 23, 1983, Ser. No. 469,056

Claims priority, application Japan, Feb. 26, 1982, 57-30096; Feb. 26, 1982, 57-30097

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.[4] F16D *65/38*

U.S. Cl. 74—501.5 R **11 Claims**



1. An operating wire control device for a brake system, comprising; a housing, an inner wire and an outer coaxial wire disposed in said housing, an adjust lever rotatable in accordance with the stroke of sid inner wire, an adjuster rotatable by the rotation of said adjust lever, said adjuster having an integrally formed ratchet wheel; an adjust bolt movable upon rotation of said adjuster to alter the relative length of said inner wire and an outer wire; said adjust lever comprising a first lever having an abutment member for detecting the stroke of said inner wire, a second lever having a ratchet pawl engaged with a ratchet tooth on said ratchet wheel, said second lever being longer than said first lever, an adjust lever spring provided between said first and second levers, and a return spring extending between said second lever and said housing, said adjust lever spring having a spring force with becomes smaller than that of said return spring when said inner wire has been pulled beyond a prescribed stroke.

4,570,507

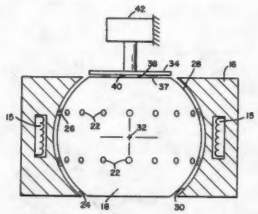
MAGNETIC FLUID GYRO BEARING AND CAGING MECHANISM

Joe S. Hunter, and Lawrence J. Little, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 19, 1983, Ser. No. 524,614

Int. Cl.[4] G01C *19/08, 19/20, 19/24, 19/26*

U.S. Cl. 74—5.12 **2 Claims**



1. A magnetic fluid gyro bearing and caging mechanism comprising a rotor and a stator member, said rotor and said stator member having corresponding spherical surfaces with a gap defined between the spherical surfaces, said rotor having a

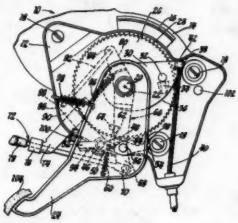
plurality of permanent magnets mounted in the surface thereof about two circumferential positions of the rotor and equally spaced about a central portion thereof, said stator having winding means mounted therein, a power supply connected to said winding means, said permanent magnets in said rotor providing an armature means for defining with said winding means a motor, and magnetic fluid means provided at each of said permanent magnets and being attracted to the permanent magnet to provide a fluid bearing between the rotor and stator, whereby when said winding means is energized, said rotor will be rotated up to speed and said magnetic fluid at said permanent magnets will provide bearing stiffness in both radial and axial directions for said rotor.

4,570,508

MULTI-STROKE PARKING BRAKE VARIABLE RATIO APPLY AND RELEASE MECHANISM

Michael A. Nicholson, Windsor, Canada, and Thomas J. Kosmanski, Davison, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1984, Ser. No. 618,665
Int. Cl.[4] G05G *5/06, 1/04*
U.S. Cl. 74—535 **1 Claim**



1. A parking brake actuation and release mechanism comprising:

a fixed mounting bracket;

a parking brake lever pivotally mounted on said mounting bracket to pivot arcuately about a pivot axis through a first maximum predetermined arc between a rest position and an applied position;

a toothed ratchet member pivotally mounted on said mounting bracket to pivot arcuately about the pivot axis through a second maximum predetermined arc which is more than twice as wide as said first arc;

an eccentric cable take-up member pivotally mounted on said mounting bracket to pivot arcuately about the pivot axis through said second maximum predetermined arc and having

drive means between said toothed ratchet member and said eccentric cable take-up member to drive said eccentric cable take-up member by said toothed ratchet member arcuately in the brake applying direction;

a first releasable pawl pivotally mounted on said mounting bracket and selectively normally engaging said toothed ratchet member to prevent brake releasing movement thereof;

means for selectively releasing said first pawl to disengage it from said toothed ratchet member;

a second relcasable pawl pivotally mounted on said parking b-ake lever and normally engaging said toothed ratchet member to drive said toothed ratchet member and said eccentric cable take-up member in the arcuate brake actuating direction with the brake actuating strokes of said parking brake lever from its rest position and to ratchet over said toothed ratchet member as said parking brake lever returns to the rest position while said first pawl is in toothed engagement with said toothed ratchet member and preventing brake releasing movement thereof;

a parking brake cable having one end secured to said eccentric cable take-up member at a maximum effective radius from the pivot axis, said cable being received by said eccentric with a decreasing effective radius from the pivot axis as said eccentric take-up member is arcuately driven in the brake actuating direction to continually increase the mechanical advantage of the cable travel relative to pedal lever movement as the mechanism applies the parking brake by tensioning the cable;

said first and second pawls cooperating with said toothed ratchet member to permit multiple parking brake lever strokes from the rest position within said first arc to drive said toothed ratchet member and said eccentric cable take-up member through said second arc to exert a maximum parking brake take-up and apply force through said cable;

said first pawl when released allowing the brake actuating tension force in said cable to return said toothed ratchet member and said eccentric cable take-up member to the brake released position;

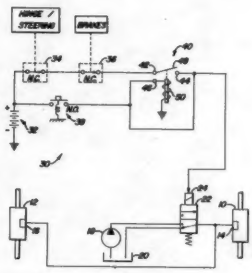
and trip means on said fixed mounting bracket engaging said second pawl as said pedal lever is returned to the rest position to hold said second pawl out of engagement with said toothed ratchet member while said pedal lever is at the rest position, said second pawl being moved during initial brake actuating movement of said pedal lever to be disengaged from said trip means and to engage said toothed ratchet member in driving relation.

4,570,509

DIFFERENTIAL LOCK CONTROL SYSTEM RESPONSIVE TO STEERING AND/OR BRAKING ACTION TO UNLOCK DIFFERENTIAL

Lester L. Nighswonger, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 13, 1983, Ser. No. 503,969
Int. Cl.[4] F16H *1/445*
U.S. Cl. 74—710.5 **1 Claim**



1. A locking differential control system for a vehicle having first and second axle shafts driven through a differential and locking means for selectively locking and unlocking the differential in response to locking and unlocking signals applied to an input thereof, the control system comprising:

a potential source;

a latching relay having a coil connected between a latch terminal and a grounded terminal and having first and second switch coupled terminals, the latch terminal and one of the switch coupled terminals being connected directly to the input of the locking means, switch means for selectively connecting and disconnecting the first and second terminals with and from each other, the coil opening and closing the switch means in response to signals applied to the latch terminal;

a normally open momentary contact operator-actuated switch coupled on one side to the latch terminal and to the input of the locking means and on its other side to the potential source to initially energize said coil and to acti-

vate said relay to position said differential in a locked position; and

first and second series-connected, normally closed switches coupled between the potential source and the other of the first and second switch-coupled relay terminals to retain the coil in an energized condition when both said first and second series-connected switches are closed;

means for opening the first normally closed switch in response to a predetermined vehicle steering operation; and

means for opening the second normally closed switch in response to a vehicle brake application whereby said coil is deenergized to deactivate said relay to unlock said differential whenever either of said first and second series-connected switches are opened concurrent with said normally open momentary contact switch being open, and the control system generating the locking signal when the potential source is communicated with the input of the locking means and generating the unlocking signal when the potential source is disconnected from the input of the locking means.

4,570,510

GEARING MECHANISM, PARTICULARLY FOR SEAT WITH ADJUSTABLE BACK REST

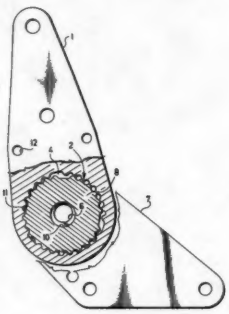
Jan Babak, Mlada Boleslav, Czechoslovakia, assignor to Automobilove Zavody, narodni podnik, Mlada Boleslav, Czechoslovakia

Filed Nov. 22, 1983, Ser. No. 554,252

Claims priority, application Czechoslovakia, Nov. 25, 1982, 8468-82

Int. Cl.⁴ F16H *1/28, 55/17*

U.S. Cl. 74—805 **3 Claims**



1. In a gearing mechanism adapted for changing the relative angular position of two arms, sdid mechanism including a ring gear which forms a unit with a first arm of the mechanism, a spur gear which forms a unit with a second arm of the mechanism, the spur gear having a diameter less than that of the ring gear and being positioned eccentrically therewithin in mesh with the ring gear, the improvement wherein the toothing of at least one of said ring gear and spur being provided with a row of teeth with at least one tooth gap, the width of such gap within the range of the working height of the teeth being at least equal to the pitch of the toothing measured at the same diameter, and at the location of the increased tooth gap on the first arm there being a supporting bridge for connecting the hub of the first arm to the main body of the first arm, whereby by the turning of the spur gear a relative angular displacement of the two arms is achieved.

4,570,511

CONTROL SYSTEM FOR HYDRAULIC TRANSMISSION

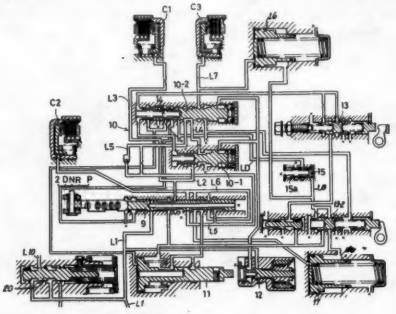
Sadanori Nishimura, and Masakazu Maezono, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,570

Claims priority, application Japan, Oct. 17, 1981, 56-164944; Nov. 6, 1981, 56-177117

Int. Cl.⁴ B60K *41/02*

U.S. Cl. 74—867 **6 Claims**



1. In a control system for a hydraulic transmission for a vehicle powered by an internal combustion engine having an air intake controlled by a throttle valve, the transmission having hydraulic engaging elements, the improvement comprising, in combination: an oil draining line adapted for connection to at least one of said hydraulic engaging elements, said oil draining line having an orifice and a control valve assembly arranged in parallel with said orifice, said control valve assembly including a valve means movable between open and closed positions, means for urging said valve means toward said closed position during shifting between hydraulic engaging elements solely with a force which increases directly proportional to increased engine throttle valve opening, means for urging said valve means to return to said open position during the completion of the shifting of the hydraulic engaging elements, and said valve means having a shape for providing a throttled rate of oil flow through said control valve assembly in an intermediate position between said open and closed positions for throttling the oil flow as said valve means moves between said open and closed positions.

4,570,512

CORK SCREW HAVING A BELL-SHAPED HOUSING

Günther Pracht, Solingen, Fed. Rep. of Germany, assignor to August Reutershan GmbH. & Co. KG, Solingen, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 679,421

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346414

Int. Cl.⁴ B67B *7/18*

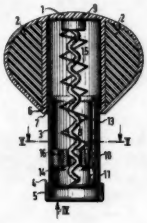
U.S. Cl. 81—3.29 **2 Claims**

1. A cork screw having a bell-shaped housing and a cork-screw blade which is secured at one of its ends to the closed end of the bell-shaped housing, the cork being able to be lifted out of a bottle neck without reversing the turning direction of the cork-screw blade, comprising

(a) a sleeve-like body (3) on which the bell-shaped housing (1) is guided and which has at its lower end a collar (5) with which the cork screw grips around the upper end of the neck (17) of a bottle to be uncorked when the cork screw has been placed on the neck of the bottle, and

(b) a spring-loaded piston (10) which is guided in the sleeve-like body (3) of the cork screw and which at the beginning of driving the cork-screw blade (8) into the cork is adjacent

to the lower end of the sleeve-like body, the cork-screw blade passing through a central passage-hole in said piston



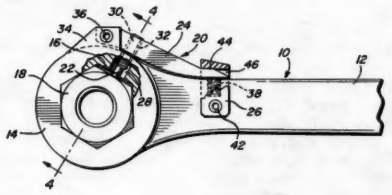
with clearance and in the starting position reaching with its free end nearly up to the lower end of the sleeve-like body.

4,570,513

WRENCH WITH NUT-RETAINING MECHANISM

Martin L. Thompson, 422 North Western, Santa Maria, Calif. 93454

Filed Feb. 1, 1984, Ser. No. 576,255
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—125 **4 Claims**



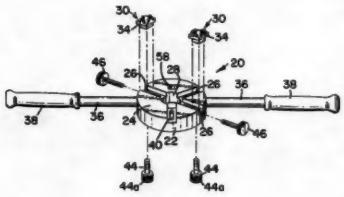
1. A wrench comprising a head defining a cavity for receiving a nut or bolt, a handle extending from the head, a mechanism for releasably retaining the nut or bolt in the cavity, said mechanism including a detent received in the head of the wrench for movement between a locking position wherein the detent is projected into the cavity and a release position where the detent is withdrawn into the wrench head, and an actuating mechanism for moving the detent between said positions, wherein the actuating mechanism includes a lever pivotally mounted on the exterior of the wrench head and extending down along the handle of the wrench, spring means interposed between the handle and the lever, the spring means urging the lever outwardly to a position wherein the detent is withdrawn from the wrench cavity into said opening, and a keeper pivotally mounted on the handle adjacent the lever and engaging the lever, wherein the lever has contiguous angularly related ramp surfaces along which the keeper can be moved without disengaging the lever, the keeper when engaging a first of the ramp surfaces allowing the lever to be urged outwardly by the spring means to the position wherein the detent is withdrawn from the wrench cavity, and the keeper when moved along the first ramp surface and into engagement with the second ramp surface camming the lever inwardly against pressure exerted by the spring means so as to move the detent into the locking position in the wrench cavity.

4,570,514

SPANNER WRENCH FOR USE WITH A MACPHERSON STRUT RETAINING NUT OR THE LIKE

Gilbert P. Schoener, Fargo, N. Dak., assignor to Branick Industries, Inc., Fargo, N. Dak.

Filed Dec. 2, 1983, Ser. No. 557,600
Int. Cl.[4] B25B *13/06*
U.S. Cl. 81—129 **5 Claims**



1. A spanner wrench for use in removing and replacing a retaining nut of a cartridge type shock absorber type assembly, said wrench comprising:

(a) a cylindrical wrench defining a substantially flat retaining nut facing end surface and a second end surface opposite therefrom, said wrench defining an axially directed aperture proximate the center thereof;

(b) two elongated handles interconnected to and extending laterally outwardly from the periphery of said cylindrical wrench body;

(c) four radially extending slots defined in said retaining nut facing end surface of said cylindrical wrench body, three of said radially extending slots being angularly displaced from one another by substantially one hundred twenty (120) degrees, a fourth of said slots being angularly displaced from two of said three slots on either side of said fourth slot by substantially sixty (60) degrees, said fourth slot being radially aligned with the third of said three slots;

(d) a plurality of adaptor members configured for removable receipt in said slots, said adaptor members being radially slideable in said slots, said adaptor members including differing retaining nut engaging portions at opposite ends thereof, said adaptor members being reversible end for end within said slots to enable either of said retaining nut engaging portions to engage said retaining nut being operated on; and

(e) means cooperating with said wrench body for releasably securing said adaptor members at selected locations along said slots radially removed from the center of said wrench body, said securing means including axially directed threaded thumb screws which are finger tightened and loosened.

4,570,515

MOVABLE WRENCH EQUIPPED WITH MOVABLE CLAW WHICH IS DRIVEN AND ROTATED BY ADJUSTING ROD

Tai-Her Yang, 5-1 Tay Pyng St., Shi Hwu Jenn, Jang Huah Shiann, Taiwan

Filed Nov. 14, 1983, Ser. No. 551,691
Int. Cl.[4] B25B *13/16*
U.S. Cl. 81—166 **1 Claim**

1. A wrench having an adjustable claw comprising:

a hollow handle, said handle having an open mouth; a first fan-shaped gear mounted in said handle and fronting said mouth;

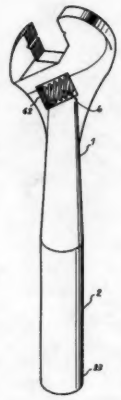
a gear axle;

a second fan-shaped gear in meshing engagement with said first fan-shaped gear;

said second fan-shaped gear axially mounted for rotation on said gear axle; a screw gear mounted on said gear axle;

a movable claw having a bottom portion thereof mounted in a track in said handle, said bottom portion having a geared surface, said gear surface in meshing engagement with a said screw gear, said bottom portion fronting the top portion of said mouth;

a hollow adjusting rod rotatingly coupled to said handle;



a rotary shaft extending from the base of said adjusting rod to the base of said first fan-shaped gear;

threaded means rotably setting said first fan-shaped gear in operative position in the said handles,

said first fan-shaped gear having groove means for cooperating with and receiving said threaded setting means.

4,570,516

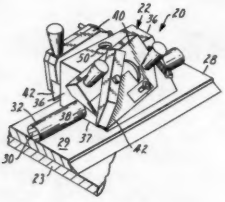
MAT BOARD CUTTER WITH WEAR ADJUSTABLE CUTTER-CARRYING BODY

Carl H. Bruns, deceased, late of Overland Park, Kans. (by Ann St. John Bruns, executrix), assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 19, 1984, Ser. No. 662,625

Int. Cl.[4] B26D *3/02, 7/02*

U.S. Cl. 83—455 **6 Claims**



1. In a mat board cutter having a base with means for positioning a mat board thereon; a clamp bar for clamping the mat board on said base and having an upper surface; a guide rail fixed along said upper surface on said clamp bar and having a peripheral guide surface including guide surface parts on both sides of said guide rail diverging from adjacent said upper surface; a cutter-carrying body having spaced end surfaces, a bottom surface, a channel defined by a surface which provides, or supports a member that provides a bearing surface for said body within said channel, said channel opening through said end surfaces, opening along one side through said bottom surface and receiving said guide rail with said bottom surface closely spaced from said upper surface of said clamp bar so that said bearing surface can slide along and be guided by said peripheral guide surface and said bearing surface having parts on both sides of said opening along one side diverging from adjacent said bottom surface; and at least one cutter device including a knife pivotably mounted on said cutter-carrying body for movement between a disengaged position with the knife spaced from the mat board and an engaged position with the knife engaged with the mat board, the improvement wherein:

said cutter-carrying body has a plurality of spaced slippery polymeric wear buttons projecting from said bottom surface adjacent said channel and positioned against the upper surface of said clamp bar, and means are provided for adjusting the amount of projection of at least one of said wear buttons from said bottom surface to position said parts of said bearing and guide surfaces in close-fitting slideable relationship.

4,570,517

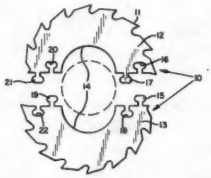
SELF-INTERLOCKING SPLIT SAW BLADE

John A. Souza, and Ross P. Souza, both of 2509-B 11th Ave., Eugene, Oreg. 97402

Filed Sep. 4, 1984, Ser. No. 647,163

Int. Cl.[4] B27B *33/08*

U.S. Cl. 83—838 **1 Claim**



1. A circular saw blade, held securely on a rotating arbor, comprising:

(a) two (2) semicircular saw blade sections, in combination comprising a circular saw blade, each section being flat, and having as edges an outer cutting semicircle, a smaller inner semicircle, concave in shape with a diameter corresponding to the diameter of the arbor, and two connecting edges, each extending from said inner semicircle to the said outer cutting semicircle; and

(b) means for interlocking the said two (2) semicircular saw blade sections together to form a single circular saw blade, said interlocking means comprising:

multiple interlocking projections and recesses on said connecting edges of each said semicircular saw blade section to receive the correspondingly shaped interlocking projections and recesses on said connecting edges of the other semicircular blade section so as to connect and self-interlock during operation and yet be readily capable of lateral disassembly to permit rapid replacement when needed without having to be removed past the end of the saw arbor;

said semicircular saw blade sections, with projections and recesses, being identically shaped to provide for full and complete interchangeability of said semicircular saw blade sections.

4,570,518

POSITIONING APPARATUS FOR TREATMENT DEVICE

Harland A. Burmeister, Outagamie County, and Lee A. Weinig, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

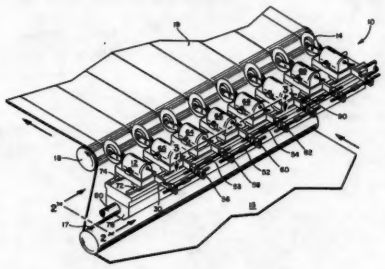
Filed Jun. 11, 1984, Ser. No. 618,967

Int. Cl.[4] B26D *1/22*

U.S. Cl. 83—504 **12 Claims**

1. Apparatus for adjusting a series of treatment devices

comprising individual linking means extending between each adjacent pair of said treatment devices and means for adjusting



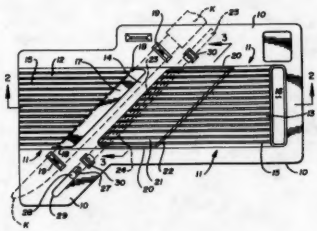
each of said linking means to change the length of said linking means, wherein each of said treatment devices is provided with a bracket for removably mounting said linking means.

4,570,519

VEGETABLE SLICER WITH THICKNESS ADJUSTMENT

Stephen J. Motosko, II, 120 Pittsburgh St., Columbiana, Ohio 44408

Filed Aug. 30, 1984, Ser. No. 645,676
Int. Cl.[4] B26D *3/28*
U.S. Cl. 83—856 **4 Claims**



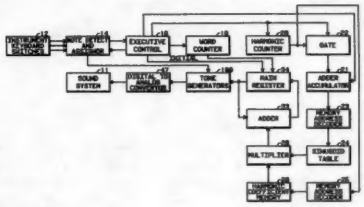
1. In a vegetable slicer for cutting vegetables, fruit and the like into portions, such as slices, said slicer having an integral horizontally disposed portion with an opening transversely thereof, a section of said integrally horizontally disposed portion being formed in freely extending relation with respect to an adjacent section of said horizontal portion and defining one side of said opening, another section of said horizontal portion defining the other side of said opening, means on said slicer for positioning a knife longitudinally of said transverse opening and adjacent said freely extending section, cams on said freely extending section and a cam bar movably positioned on said vegetable slicer for engagement with said cams for moving said freely extending section vertically so that a vegetable being moved longitudinally of the device and across said opening may be selectively presented to a knife in said opening so as to control the thickness of slices removed from said vegetable.

4,570,520

TONE GENERATOR ASSIGNMENT IN A KEYBOARD ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instruments Mfg. Co., Ltd., Hamamatsu, Japan

Filed Mar. 19, 1984, Ser. No. 591,353
Int. Cl.[4] G10H *1/22, 7/00*
U.S. Cl. 84—1.01 **12 Claims**



1. In combination with a keyboard musical instrument comprising a keyboard array of a number of keyswitches and having a plurality of tone generators smaller in number than the number of keyswitches in said keyboard array, apparatus for assigning members of said plurality of tone generators to actuated keyswitches in a manner such that a tone generator is always assigned to the latest actuated keyswitch comprising:

a keyswitch state detect means wherein a detect signal is generated in response to each actuated keyswitch in said keyboard array of keyswitches,

an encoding means for encoding each said detect signal to generate a detect data word which identifies each said actuated keyswitch corresponding to a generated detect signal,

an assignor means responsive to each said detect data word whereby one of said plurality of tone generators is assigned to generate a musical tone associated with a corresponding keyswitch contained in said keyboard array of keyswitches,

a tone generator status means whereby a kill signal is generated if all of said plurality of tone generators have been assigned to generate musical tones and an additional data detect word is generated, and

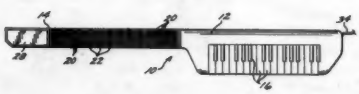
a tone generator remove means responsive to said kill signal whereby a detect data word supplied to said assignor means is replaced by said additional data select word.

4,570,521

ELECTRONIC MUSICAL INSTRUMENT WITH STRING-SIMULATING SWITCHES

Jeffrey Fox, 4105 Madison, Culver City, Calif. 90230

Filed Mar. 30, 1984, Ser. No. 595,294
Int. Cl.[4] G10H *1/34, 5/00*
U.S. Cl. 84—1.01 **20 Claims**



19. In an electronic musical instrument of the type having a body and a player-actuable switching mechanism for producing selected musical tones through electronic tone-generating means, an improved switching mechanism, comprising:

a fingerboard of electrically-insulative material attached to said body and having a plurality of individual cavities arranged in a longitudinal row underneath the external

surface thereof, said fingerboard being deformable in a flexible area above each of said cavities;

a plurality of separate, pressure-actuable switches, each disposed in one of said cavities, each of said switches being adapted to be separately closed in response to the localized deformation of said fingerboard in one of said flexible areas; and

an elongate, continuous, flexible bar disposed on said fingerboard above said row of cavities;

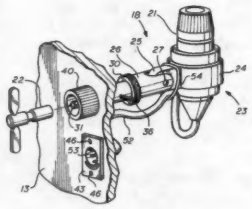
whereby the application of pressure to said bar at a location above a selected one of said cavities results in a localized resilient deformation of said bar and the underlying flexible area, thereby closing the switch in said selected cavity, said deformation being sufficiently localized to close only the switch in said selected cavity.

4,570,522

ELECTRO-ACOUSTICALLY AMPLIFIED DRUM AND MOUNTING BRACKET

Randall L. May, 8312 Seaport Dr., Huntington Beach, Calif. 92646

Filed Dec. 19, 1983, Ser. No. 563,150
Int. Cl.[4] G10H *3/00*
U.S. Cl. 84—1.14 **26 Claims**



1. An electro-acoustically amplified drum assembly comprising

a hollow drum shell having a longitudinally central axis,

a drum head closing at least one end of said drum shell

an acoustical microphone positioned in said drum shell spaced from and free from any connection to said drum head and adapted to be connected to an external amplifier and speaker,

an adjustable mount secured on and extending through the wall of said drum shell and supporting said microphone therein, and

mount position adjusting means at least partially operated from outside said drum shell for adjusting the position of said mount radially in said drum shell and rotatably about a radius of said drum shell to position said microphone in a selected position for minimizing microphone interference and optimizing proximity effect and sound quality.

4,570,523

REVERBERATION TONE GENERATING APPARATUS

Tsuyoshi Futamase, and Mitsumi Kato, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 400,137, Jul. 20, 1982, abandoned. This application Sep. 25, 1984, Ser. No. 654,387
Int. Cl.[4] G10H *1/043*
U.S. Cl. 84—1.24 **6 Claims**

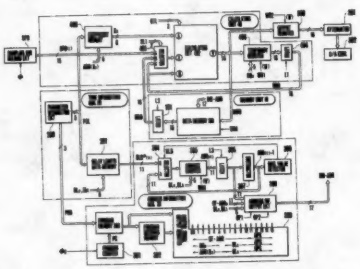
1. Digital reflection and reverberation tone generating apparatus comprising:

coefficient memory means for storing first coefficients which determine an initial reflection characteristic and second coefficients which determine a reverberation characteristic of a generated musical tone signal;

program memory means for storing a first program which provides the sequence of calculations to impart said initial reflection characteristic in said tone signal and a second program which provides the sequence of calculations to impart said reverberation characteristic in said tone signal;

calculation means for performing the sequence of calculations specified by said first program and said second program;

control means for reading out said first coefficients, said first program, said second coefficients and said second program and for providing said calculating means therewith, said calculating means performing said calculations using said first coefficients on a time division basis in accordance



with said first program and outputting an initial reflection tone signal, and performing said calculations using said second coefficients on a time division basis in accordance with said second program and outputting a reverberation tone signal; and

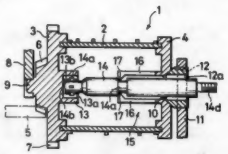
delay means including a first delay means and a second delay means, said first delay means providing time delay for said initial reflection characteristic in said tone signal and said second delay means providing time delay for said reverberation characteristic in said tone signal in parallel, whereby said first delay means and said second delay means are operated on by said control means.

4,570,524

DRUM IN MUSIC BOX

Akihiko Isaka, and Takeo Saito, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Jan. 21, 1983, Ser. No. 459,910
Claims priority, application Japan, Apr. 19, 1982, 57-56637
Int. Cl.[4] G10F *1/06*
U.S. Cl. 84—96 **3 Claims**



1. A drum for a music box comprising: an opening which is formed in one end plate at the center of rotation of the drum, bearing means having a through hole communicating with said center hole for rotatably supporting said end plate, first engaging means essentially making integral said drum to an external output shaft; said output shaft adapted to pass through said opening, said through hole and the drum in the direction of rotation; said opening and said through hole each having a diameter much greater than that of said output shaft; second engaging means for essentially making integral axially said external output shaft with said drum; and third engaging means

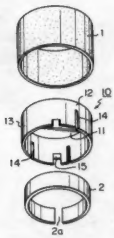
for stopping the inner end of said external output shaft to be inserted into said opening; wherein said first, second and third engaging means are positioned together at a single predetermined position within said drum.

4,570,525

ADJUSTABLE BOTTOM CLOSURE FOR A RESONATOR ON SOUND BAR TYPE PERCUSSIVE MUSICAL INSTRUMENTS

Shigeo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 9, 1984, Ser. No. 670,400
Int. Cl.[4] G10D *13/08*
U.S. Cl. 84—410 **9 Claims**



1. An improved adjustable bottom closure for a resonator on sound bar type percussive musical instruments comprising

a tubular gasket,

a tubular main body arranged in said gasket and including an end wall, and a side wall extending longitudinally from the periphery of said end wall and provided with at least one longitudinal slot, and

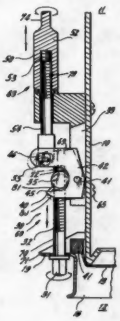
means for causing radial expansion of said side wall in pressure contact with said gasket.

4,570,526

TENSIONING DEVICE FOR A DRUM HEAD

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Nov. 21, 1984, Ser. No. 673,530
Claims priority, application Japan, Apr. 20, 1984, 59-58853
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—413 **14 Claims**



1. A drum head tensioning apparatus for a musical instrument drum, the drum having a hollow body enclosed by a peripheral wall and having a top and a bottom axial opening which are covered by respective top and bottom drum heads, the drum heads including respective top and bottom sound membranes, the apparatus comprising:

a movable element pivotally secured to the drum body and vertically swingable between a lower position tilted more toward the lower drum head and an upper position tilted more toward the upper drum head;

first tensioning means for adjusting the tension on the bottom drum head membrane, the first tensioning means extending from the bottom drum head and being anchored to the movable element such that tightening the first tensioning means pulls the movable element toward the lower position and also increases the tension on the bottom membrane; and

second tensioning means also anchored to the movable element and having an end extending toward the top drum head; means located toward the end of the second tensioning means operable for moving the movable element with respect to the motion caused by the first tensioning means for further adjusting the tension of the bottom drum head membrane.

4,570,527

BUNDLE DRUM STICK

Kenneth W. Pruitt, 4865 Dowing St., Baldwin Park, Calif. 91706

Filed Oct. 1, 1984, Ser. No. 656,749
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 S **10 Claims**

1. A bundle drum stick comprising a cluster of between 6 and 12 wooden rods having a length between 12 and 18 inches and a diameter between 0.100 and 0.187 inches firmly secured together only at one end to form a handle and with the remaining length thereof unrestrained but resistant to flexing while in movement in air toward contact with a percussion musical instrument.

4,570,528

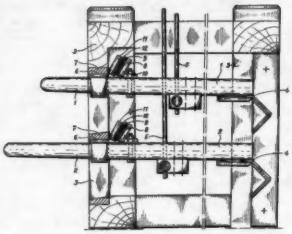
KEYBOARD FOR A CARILLON

Peter Bakker, Nijkerk, Netherlands, assignor to Koninklijke Eijsbouts Klokkengieterij En Fabriek Van Torenuurwerken B.V., Asten, Netherlands

Filed Jun. 15, 1983, Ser. No. 504,487
Claims priority, application Netherlands, Jun. 17, 1982, 8202457
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—423 R **5 Claims**

1. A carillon keyboard having a frame and keys mounted therein in which the frame and the keys themselves are respectively provided with limiting means having cooperating surfaces limiting the upward release movement of the keys by

their mutual contact, said keys being pivotally mounted about a substantially longitudinal axis, said surfaces being in an in-



clined position with respect to the upward direction of release movement of the keys.

4,570,529

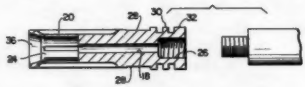
FLASH SUPPRESSOR FOR FIREARMS HAVING RIFLED BARRELS

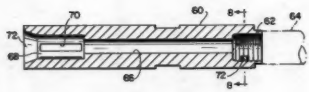
Anthony A'Costa, P.O. Box 5806, Pueblo, Colo. 81002

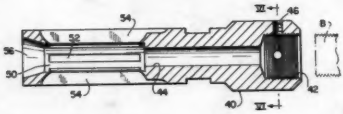
Continuation-in-part of Ser. No. 404,938, Aug. 3, 1982, abandoned. This application May 23, 1984, Ser. No. 613,180

Int. Cl.⁴ F41C *21/18*

U.S. Cl. 89—14.2 **14 Claims**







1. A flash suppressor for use on a rifled barrel of a firearm comprising

a generally cylindrical body member having a first portion adapted to receive a projectile from said barrel and a second portion adapted to receive a projectile from said first portion,

said first portion having a longitudinal smoothbore passage therethrough through which a projectile discharged from said barrel passes, and said smoothbore passage having a diameter less than the diameter of a circle passing through the bottom of the rifling grooves in said barrel,

said second portion having an inside diameter significantly greater than the diameter of said smoothbore passage, and

a plurality of radially directed vent openings formed in said second portion of said body member.

4,570,530

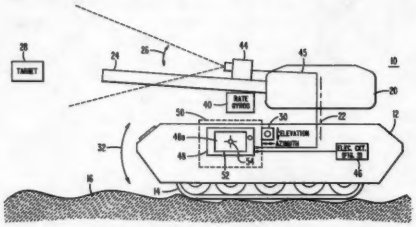
WORKPIECE ALIGNMENT SYSTEM

Lee R. Armstrong, Middlesex County, Mass., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 14, 1983, Ser. No. 561,175

Int. Cl.⁴ F41G *5/24;* **H04N** *3/36*

U.S. Cl. 89—41.05 **14 Claims**



1. A system for aligning a movable workpiece with a target, comprising in combination:

an electronic scene observing first means adapted for movement with said workpiece for viewing whatever said workpiece is aligned with;

an electronic scene displaying second means coupled to said scene observing means for displaying a portion less than all of the scene viewed by said scene observing means, said scene displaying means having a control terminal responsive to a control signal for determining what portion of the observed scene is displayed;

third means producing a first signal indicative of the rate of movement of said workpiece;

fourth means producing a second signal indicative of the desired rate of movement of said workpiece; and

fifth means responsive to said first signal and second signal for providing to said control terminal said control signal for causing said image displayed on said displaying means to move only at a rate set by said fourth means whereby when said fourth means is set to indicate a zero rate of movement of said first means the displayed image is stationary even though said first means may be in motion.

4,570,531

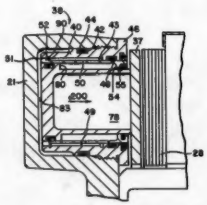
EXTENSIBLE PISTON WITH BREAKABLE OR DISPLACEABLE COUPLER

Bruce W. Anderson, Niles, Mich., and Warren D. Chambers, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 9, 1984, Ser. No. 578,711

Int. Cl.⁴ F01B *7/20*

U.S. Cl. 92—52 **18 Claims**



1. Fluid pressure actuated piston means and extensible cylinder means therefor comprising a casing having a cavity therein, breakable coupling means disposed at an end of said cavity and positioned by the casing, the extensible cylinder

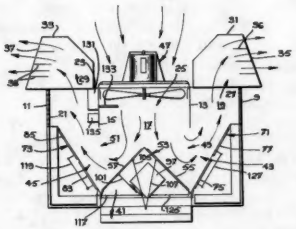
means slidably disposed in said cavity and responsive to pressurized fluid supplied to said cavity, the cylinder means including abutment means disposed at each end thereof, a piston slidably contained by said cylinder means and responsive to said pressurized fluid, the piston including engagement means engagable with said cylinder means for coupling said cylinder means with said piston when the piston has been displaced a predetermined distance, the pressurized fluid supplied to said cavity acting upon said piston to move said piston relative to said cylinder means and casing, the cylinder means being prevented from extending outwardly relative to said casing by positive restraining engagement of one of said abutment means with said breakable coupling means, said supply of pressurized fluid displacing the piston until the engagement means couples the piston with said cylinder means so that combined fluid pressure upon the cylinder means and piston causes said coupling means to break and thereby release said cylinder means for movement relative to said casing and allow further movement of said piston relative to said casing.

4,570,532

VENTILATING UNIT FOR ANIMAL BUILDINGS

Raymond R. Labelle, R.R. 1, Valcourt, Quebec, Canada (J0E 2L0)

Filed Jun. 28, 1984, Ser. No. 625,773
Int. Cl.[4] F24F *13/00*
U.S. Cl. 98—34.5 **3 Claims**



1. A ventilating unit for use in a building, particularly an animal building, to circulate and/or change air in said building, said unit comprising:

a housing having one side intended to be located within the building to be serviced and another side to be located outside said building, said housing being partitioned to define a first lateral intake duct, a second lateral intake duct and an exhaust duct centrally positioned between the first and second intake duct, said exhaust duct having an inlet on said one side of the housing and an outlet on said one side of said housing, said housing also having air transfer openings for connecting the exhaust duct to the intake ducts;

a fan mounted in the inlet of the exhaust duct for drawing air from the building into the exhaust duct;

first valve means mounted in the housing at the outlet of the exhaust duct, said first valve means comprising a pair of flaps;

second and third valve means mounted in the housing at the inlets of the first and second intake ducts respectively;

cowls at the outlets of the intake ducts for directing air in opposite directions away from the inlet of the exhaust duct;

angularly adjustable fins mounted in the cowls to adjust the distribution and circulation of the air passing through the cowls;

means for moving the first valve means to any position between, and including, a first position wherein the flaps of said first valve means close the exhaust outlet and leave the transfer openings opened and a second position wherein the exhaust outlet is left opened and said flaps close the transfer openings, said means for moving the first valve means comprising a motor for moving one flap and link means extending between the two flaps for having the one flap move the other flap when the one flap moves;

means for moving the second and third valves means between, and including, a first position wherein the intake inlets are closed and a second position wherein the intake inlets are opened, said means for moving the second and third valve means comprising first linkage means connecting one of the flaps of the first valve means to the third valve means and second linkage means connecting the other flap of the first valve means to the second valve means,

a first air temperature sensor to be located at a remote distance from the unit inside the building, said first sensor being connected to the fan to control its speed;

a second air temperature sensor located in the housing close to the exhaust inlet, said second sensor being connected to the motor used for moving the flaps of the first valve means to adjust the position of said flaps between, and including, their first and second respective positions; and

an adjustable limiting circuit mounted between the second sensor and the motor used for moving the flaps to prevent said flaps from being continuously and permanently adjusted;

spring means for automatically opening the valve means in the event of a power failure;

whereby, in use

adjustment of the first, second and third valve means in their first respective positions causes all the air drawn from the building into the exhaust duct by the fan to be returned through the intake ducts via the transfer openings after having been substantially equally divided therebetween;

adjustment of said first, second and third valve means in their second positions causes all the air drawn into the exhaust duct by the fan to be exhausted and fresh make up air from the outside to be drawn in through the intake ducts; and

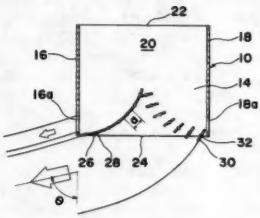
adjustment of said first, second and third valve means in intermediate positions between their first and second respective positions causes part of the air drawn in the exhaust duct to be exhausted and part to be returned and mixed with fresh air drawn in through the intake ducts.

4,570,533

FLUID DEFLECTING ASSEMBLY

Norio Sugawara, and Motoyuki Nawa, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Oct. 15, 1984, Ser. No. 661,175
Claims priority, application Japan, Oct. 13, 1983, 58-191142; Dec. 23, 1983, 58-246026; Mar. 16, 1984, 59-51427; Apr. 18, 1984, 59-77982
Int. Cl.[4] F24F *13/14*
U.S. Cl. 98—40.24 **13 Claims**



1. A fluid deflecting assembly comprising a passage defining structure having a fluid passage defined therein for the passage of a fluid stream in one direction therethrough, said fluid passage having a fluid inlet and a fluid exit spaced apart from the

fluid inlet, and at least one group of deflector blades pivotally supported within the passage defining structure adjacent the fluid exit for movement through a predetermined angle and arranged in such a curved row that, when the deflector blades are pivoted in one direction to a deflecting position, said deflecting blades altogether form a generally continuously curved guide wall extending within the passage defining structure so as to diverge away from the direction of flow of the fluid stream through the passage, said guide wall being operable to draw the fluid stream close thereto to deflect the fluid stream as a whole by the Coanda effect known per se as it emerges outwards from the fluid exit.

4,570,534

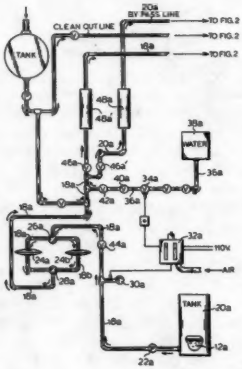
REDUCED ALCOHOL WINE AND ITS MANUFACTURE

Armand Boucher, Stamford, Conn., assignor to Joseph E. Seagram & Sons, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 341,363, Jan. 21, 1982, Pat. No. 4,405,652. This application Nov. 29, 1982, Ser. No. 445,064

Int. Cl.⁴ C12F *1/00*

U.S. Cl. 99—277 **12 Claims**



1. A system of reducing the alcohol content of wine comprising:

a source of the original wine product;

an original wine product inlet line coupled with the source;

an original wine product feeding means for feeding an original wine product from the source through the original wine product inlet line;

a centrifugal film evaporator coupled with the original wine product inlet line for elevating the temperature of the original wine product while being centrifuged to a temperature at which a predetermined part thereof is divided into a liquid phase and a vapor phase, the liquid phase being a reduced alcohol wine and the vapor phase being a vaporized by-product of relatively high proof, the centrifugal film evaporator having means for removing the liquid phase by centrifugation and means for moving the vapor phase therefrom;

a bypass line coupled with the source of the original wine product for bypassing the evaporator with original wine product;

an outlet line extending from the evaporator for directing the liquid phase from the evaporator;

means connecting the bypass line and outlet line for mixing the liquid phase with the original wine product in a predetermined ratio;

distillation means coupled with the evaporator for receiving the vapor phase and for increasing the alcohol content of the vapor phase; and

a condenser being coupled with the distillation means for cooling and condensing the higher proof vapor phase and means for collecting the higher proof product.

4,570,535

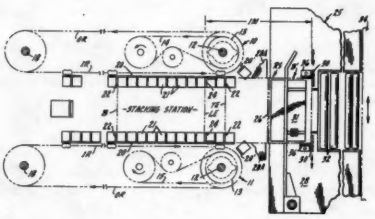
STACKING AND STRAPPING MACHINE

George D. Higgins, Orland Park, and James Wrona, Burbank, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Oct. 18, 1984, Ser. No. 662,456

Int. Cl.⁴ B65B *13/00*

U.S. Cl. 100—7 **1 Claim**



1. In a macine for stacking books at a stacking station, and having a pair of laterally spaced endless converyors supported for indexing movement stepwise in unison, said conveyors having inside and outside runs and each being equipped with longitudinally spaced pushers, one opposite another, for successive engagement, at the inside run, with the trailing edges of successive stacks of books to deliver successive stacks of books from the stacking station forwardly in the direction of a receiving station, and wherein the end turns of the endless conveyors between the two stations are each supported on a turning axis for reverse turns 180° outward to their respective outside runs, the pushers diverging from one another and eventually discontinuing contact with the stack during the reverse turn, the improvement comprising:

a support means at the receiving station for receiving successive stacks of books;

stop means positoned for movement in a plane normal to said support means, having a closed position to stop the stack on the support means so the stopped stack may be strapped, and an open position to release the strapped stack;

said turning axes being so spaced rearwardly from the plane of said stop means that when the pushers discontinue movement at the termination of an indexing step they have pushed the stack to be strapped to said plane and back up the trailing edge of that stack; and said pushers being so spaced longitudinally from one another on the related conveyor that when the conveyors are indexed the stack of books advanced by the pushers out of the stacking station push the strapped stack out of the receiving station.

4,570,536

ELECTRICALLY ACTUATED CAN CRUSHER

Robert N. Dodd, 6525 Casa Vista, Loomis, Calif.

Filed Mar. 2, 1984, Ser. No. 585,518

Int. Cl.⁴ B30B *9/32*

U.S. Cl. 100—53 **7 Claims**

2. An electrically operated can crusher comprising:

a housing having an access opening communicating with the interior thereof;

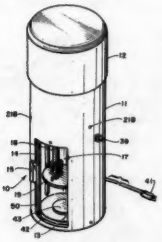
a manually operated electrically coupled door in said housing movable from a first position closing off said access opening to a second position exposing said access opening to the atmosphere;

a first ram plate fixedly mounted in said housing at the bottom thereof;

a selectively vertically movable second ram plate, a

threaded vertically mounted shaft, said second ram plate mounted in said housing above said first ram plate and mounted on the threaded vertically mounted shaft, gearing and motor means in threaded engagement with said threaded shaft, said motor means adapted to move said shaft vertically when said motor means is actuated;

said motor means coupled to said second ram plate and adapted to move said second ram plate from a first position above said first ram plate vertically downwardly to a second position directly above said first ram plate to thereby crush the ends of a can placed vertically between said first and second ram plates when said second ram plate is in its second position;



track means provided in the interior of said housing engaging said door for retaining said door in a predetermined position in said housing, said door being movable within and retained within said track means;

switching means coupled to both said motor means and said door for indicating opening of said door during actuation of said motor means and adapted to stop the actuation of said motor means, and

a reversing means comprising a power assist spring connected to a lever, said lever being both vertically disposed in a slot, and connected to said second ram plate, said spring also being connected indirectly to said motor means.

4,570,537

PRINTING APPARATUS WITH ARTICLE DRIVEN TEXT ROLL

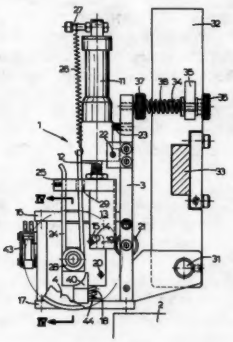
Jacobus H. de Groot, Noordwijkerhout, Netherlands, assignor to B.V. Korthofah, Netherlands

Filed Aug. 29, 1984, Ser. No. 645,613

Claims priority, application Netherlands, Aug. 31, 1983, 8303030

Int. Cl.[4] B41F *17/26*

U.S. Cl. 101—35 **10 Claims**



1. Printing apparatus for applying a coding on a surface which is transported past the printing apparatus, comprising a text roll for the coding characters supported by a frame and rotatably mounted on a shaft, which text roll can be driven by the passing surface, and a rotatable inking means for inking the coding characters, wherein the text roll is movable backwards and forwards in radial direction, and a driving means is provided for rotating the text roll and moving the text roll in radial direction from the rest position, in which the text roll is completely free of the surface to be coded, to a working position, in which the text roll engages the surface to be coded, when a surface to be coded comes up to the text roll, and in that the driving means is adapted to return the text roll in radial direction and to rotate the text roll to the rest position from an end position reached by the coding operation after applying the coding, wherein the driving means operates a stop block movable backwards and forwards, said stop block having a first recess adapted to cooperate with a pin of the text roll, wherein the shaft of the text roll is borne in a bearing block movable backwards and forwards in the same direction as the stop block, said bearing block being movable by the stop block, wherein said stop block is adapted to rotate the text roll to the working position by means of the pin during the forward motion and to move the bearing block together with the text roll during the last part of the forward motion whereas the bearing block is returned by a return means during the first part of the backward motion of the stop block, the stop block further being coupled by a coupling member to the text roll for rotating the text roll to the rest position determined by said recess during the remaining part of the backward motion.

4,570,538

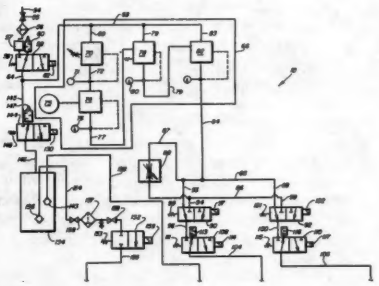
PRESS DAMPENING SYSTEM

Claymon D. Webb, Dwight, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Jun. 17, 1983, Ser. No. 505,221

Int. Cl.[4] B41F *7/30;* **B41L** *25/12*

U.S. Cl. 101—148 **17 Claims**



1. A system for supplying dampening fluid to a rotating cylinder of a printing press, comprising:

two dampening solution tanks;

means for delivering dampening solution to said cylinder alternately from each of said tanks;

a source of dampening solution;

means connecting said source of dampening solution alternately with each of said tanks for filling an empty tank while dampening solution is delivered to the cylinder from the other tank; and

means to sense the level of the one dampening solution tank delivering dampening fluid to the cylinder, said level sensing means at a low level activating a control means to alternate the delivery of dampening fluid to the cylinder from the other tank.

4,570,539

METHOD OF ADJUSTING THE INKING UNIT OF A PRINTING MACHINE AND A MEASURING DEVICE FOR PERFORMING THE SAME

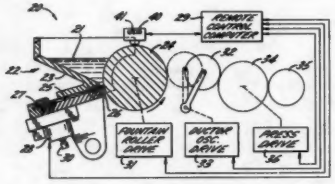
Hans-Jürgen Rottstedt, Heusenstamm, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1984, Ser. No. 646,260

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1983, 3331208

Int. Cl.[4] B41F *31/04, 31/10;* B41L *27/16*

U.S. Cl. 101—426 3 Claims



1. A method of adjusting the inking unit of a printing machine having a plurality of ink dosing elements disposed along the length of an ink fountain roller, means for adjusting the distances of the ink dosing elements from the fountain roller independently of one another to thereby regulate the amount of ink applied to a plurality of inking zones along the length of the fountain roller corresponding to respective ones of the ink dosing elements, and an optical densitometer having a sensing head for measuring by light-dark sensing the amount of ink applied to the fountain roller, the optical densitometer being slidably mounted on a rail mounted substantially parallel to the fountain roller, said method comprising the steps of:

(a) manually positioning the densitometer so that its sensing head is aligned with an ink-free zone of the fountain roller and using the measured response of the densitometer for calibration by adjusting the densitometer to register a predetermined maximum light intensity,

(b) bringing a first one of said ink dosing elements to a reference position with respect to said fountain roller by manually adjusting said first ink dosing element so that a slight application of ink is just detectable by the human eye in the entire inking zone regulated by said first ink dosing element,

(c) manually positioning the densitometer to a first one of the inking zones regulated by said first ink dosing element and using a locating mechanism engaging said rail at periodically spaced positions along said rail corresponding to the inking zones including a position along said rail corresponding to the first inking zone for aligning the sensing head with the first inking zone,

(d) obtaining the densitometer measurement for the amount of ink applied to said fountain roller at the first inking zone,

(e) successively and manually positioning the densitometer to each of the other of said inking zones and using said locating mechanism engaging the rail at corresponding positions for aligning the sensing head with each of the other of said inking zones, obtaining densitometer measurements and adjusting each of the other ink dosing elements until the measured amount of ink applied to the fountain roller at the other of said inking zones corresponds to the measured amount of ink applied to the fountain roller at the first one of said inking zones, so that said ink dosing elements are adjusted to corresponding reference positions, and

(f) adjusting the ink dosing elements by respective predetermined amounts from the reference positions obtained in steps (b) and (e), in order to obtain a desired ink profile.

4,570,540

LOVA TYPE BLACK POWDER PROPELLANT SURROGATE

Frank H. Bell, Logan, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 9, 1984, Ser. No. 639,037

Int. Cl.[4] C06B *45/10*

U.S. Cl. 102—202 12 Claims

1. An igniter composition having a burn rate exponent of about zero consisting essentially of about 45% to about 66% by weight of a metallic nitrate selected from the group consisting of potassium nitrate and sodium nitrate and about 34% to about 55% by weight of cellulose acetate.

4,570,541

SAFETY DEVICE FOR GROUND IMPACT DETONATORS IN FRAGMENTATION AMMUNITION

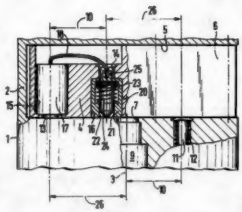
Erich Bock, Nuremberg; Helmut Hammer, Heroldsberg, and Günther Postler, Rothenbach, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,387

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1983, 8322610[U]

Int. Cl.[4] F42C *19/06*

U.S. Cl. 102—216 3 Claims



1. Safety device for ground impact detonators in fragmentation ammunition including an electrical ignition circuit; a housing; a slider with a detonator movable within said housing between "secure" and "live" positions; a primer charge fixedly arranged in said housing, contact terminal post; and an electrical inertia switch; the improvement comprising in that said slider incorporates said inertia switch, said inertia switch being coaxial with the contact terminal post only in the "live" position of said slider, and a sideways distance being present between the inertia switch and the contact terminal post in the "secure" position of said slider.

4,570,542

RIBBON RAIL SYSTEMS

Harold E. Cable, Thornburg Borough, and Anil N. Rodrigues, Pittsburgh, both of Pa., assignors to Weld Tooling Corporation, Pittsburgh, Pa.

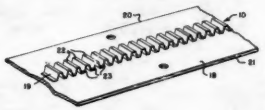
Continuation of Ser. No. 378,879, May 17, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,429

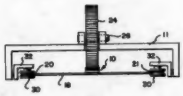
Int. Cl.[4] B61B *13/04;* E01B *25/02*

U.S. Cl. 104—119 9 Claims

1. An elongate formable drive rail for carrying a working apparatus having a toothed driving gear drivingly engaging said rail and support means engaging a portion of the edge of the side rail for supporting said apparatus comprising an elongate narrow flexible first strip of metal of width selected to carry said working apparatus, a second narrower strip of metal having a regular series of corrugations formed in said second strip extending lengthwise of said first strip intermediate its edges, said corrugations lying in planes transverse to the width of the first strip and corresponding substantially in shape and width along the median line of the strip to the tooth configura-

tion of the toothed driving gear of said working apparatus and firmly fixed at each successive valley of the corrugations to said first strip on one face thereof to provide a drive rack engageable by the toothed drive gear of the apparatus, said





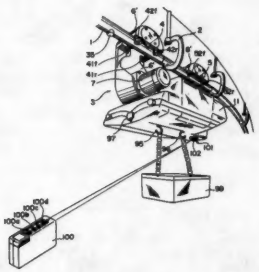
drive rack and first strip being deformable in compound directions to follow the contour of an irregular work surface and to permit movement of the gap in the corrugations so that when the rail is bent the gear teeth can enter and leave the gap without excessive binding.

4,570,543

CONVEYING EQUIPMENT

Takashi Ishikura, and Hisakazu Sakamoto, both of Osaka, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Jun. 28, 1983, Ser. No. 508,678
Claims priority, application Japan, Jun. 30, 1982, 57-114368
Int. Cl.[4] B60L *15/40*
U.S. Cl. 104—300 **6 Claims**



1. A conveying apparatus comprising a single overhead rail and a conveying vehicle;

said single overhead rail having a round periphery and having a substantially uniform cross-sectional configuration throughout its length, said cross-sectional configuration having a height in a vertical direction and a width in a horizontal direction, the width of the cross-sectional configuration being at a maximum at a mid-point of the height;

said vehicle comprising two main wheels which contact the rail at its upper periphery and which are rotatable and spaced apart in a moving direction of the vehicle, a wheel shaft bearing member provided for each main wheel, pairs of subwheels are provided on each side of the rail and in contact with the rail at its maximum width, each pair having a rotatable subwheel on each side of a main wheel in the moving direction;

an electric motor for driving at least one of the main wheels, an electrical circuit for controlling operation of said motor, batteries for providing a power source for said motor and means for supporting a hanging load rotatably connected to each wheel shaft bearing member.

6. A conveying apparatus as set forth in claim **1**, and further including

an optical remote control unit,

a photo sensor which receives a photo signal generated by said remote control unit and photo-electrically converts said signal, and

said electrical circuit for controlling operation of said motor is operatively connected to said converted signal from said photo sensor to process said converted signal,

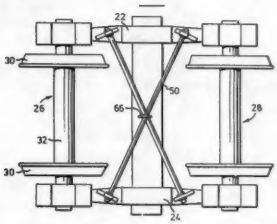
said photo sensor having its sensor eye positioned at a bottom side of said conveying vehicle.

4,570,544

DIAGONALLY BRACED RAIL TRUCK

Roy E. Smith, Kingston, Canada, assignor to Urban Transportation Development Corp. Ltd., Toronto, Canada

Filed Jun. 16, 1982, Ser. No. 388,909
Int. Cl.[4] B61F *3/10, 5/14, 5/24, 5/30*
U.S. Cl. 105—165 **32 Claims**



1. A truck comprising a truck frame including a pair of laterally spaced side frames, a pair of wheelsets extending between said frames at opposite ends thereof and supported for rotation about a horizontal transverse axis, connecting means to connect each said side frame to its associated said wheelset, first resilient means interposed between said wheelsets and respective ones of said side frames to provide flexibility between each said side frame and its associated said wheelset to permit controlled movement of said wheelsets from a mutually parallel position and thereby determine the yaw stiffness of said truck, and bracing means independent of said connecting means, said bracing means extending between said side frames to oppose relative longitudinal movement therebetween, said bracing means comprising a pair of struts inclined to the longitudinal axis of said truck and second resilient means associated with said struts and deformable upon relative longitudinal movement between said side frames, said first resilient means and said bracing means providing an increased lateral stiffness to provide a controlled flexibility in shear to said truck to improve the stability thereof.

4,570,545

CONNECTING MEANS FOR A STANCHION IN A RAILWAY CAR

Lionel Sherrow, Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Sep. 19, 1983, Ser. No. 533,389
Int. Cl.[4] B61D *17/00*
U.S. Cl. 105—354 **12 Claims**

1. In combination with a railway car having a spaced roof and a ceiling having an opening to receive connecting elements therethrough, and a seat inside said car,

connecting means for connecting a stanchion from said seat to said ceiling comprising:

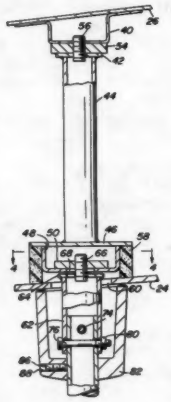
(a) a stub post assembly connected between said roof and said ceiling;

(b) means secured to said seat to receive the bottom end of said stanchion;

(c) said seat being connected to and extending freely from a

side wall of said car and unsupported by said stanchion, and

(d) adjustment means including an adapter unit attached to



said stub post to receive the top end of said stanchion and permit it to be pivoted into position with respect to said seat and for securing said stanchion to said stub post assembly adjacent said ceiling.

4,570,546

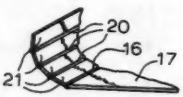
MULTI-SCORED TAB SLIP SHEETS

Joseph J. Batelka, Wayne, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed May 10, 1984, Ser. No. 609,096

Int. Cl.[4] B32B *3/02*

U.S. Cl. 108—51.1 **7 Claims**



1. A slip sheet, which serves as a unitizing base to hold a load of products and to be gripped and moved with the load to any desired location, comprising:

a generally flat sheet of relatively stiff paperboard material scored at one end along a first line generally parallel to the edge of the sheet to define a base on which to place the load and a tab projecting from the base and load to be gripped to move the sheet;

the said tab being scored along at least three secondary score lines parallel to the first line to define a plurality of minitabs not exceeding one inch in width which will assume a rounded springback configuration when the slip sheet is combined with a unitized load;

whereby each secondary score line acts as a bending loci so that the tabs will bend and buckle when the load contacts an adjacent load and not cause any damage to such adjacent load.

4,570,547

TABLE WITH ADJUSTABLE HEIGHT MECHANISM

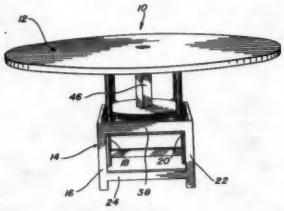
Edward Colby, 214 St. Sacrement St., Montreal (Quebec), Canada (H2Y 1W8)

Filed Feb. 27, 1984, Ser. No. 583,845

Claims priority, application Canada, Mar. 4, 1983, 422867

Int. Cl.[4] A47B *9/04, 11/00*

U.S. Cl. 108—141 **6 Claims**



1. A table comprising:

a base support;

vertically displaceable means mounted on said base support;

said vertically displaceable means including a plurality of vertically extending threaded posts;

first rotatable means mounted on said base support threadably engaging said threaded posts for causing vertical displacement of said vertically displaceable means relative to said base support;

second rotatable means mounted to said base support and engaging said first rotatable means to transfer rotation thereto;

a drive shaft engaging said second rotatable means, said shaft being slidably mounted relative to said second rotatable means;

a top plate resting on said vertically displaceable means, an annular support frame disposed at the upper extremity of said threaded posts; said support frame receiving said top plate thereon; said top plate being fixedly mounted on said drive shaft whereby rotation of said top plate is transferred to said first rotatable means via said drive shaft and said second rotatable means to thereby simultaneously raise or lower said vertically displaceable means and said top plate.

4,570,548

SECURE CONTAINER AND ACTUATOR FOR A SHEET DISPENSING APPARATUS

Harvey G. Martin, Sussex, and Nicholas A. Bruin, Hampshire, both of England, assignors to De La Rue Systems Limited, London, England

Filed Feb. 20, 1985, Ser. No. 703,533

Claims priority, application United Kingdom, Feb. 20, 1984, 8404364

Int. Cl.[4] E06B *7/32*; E05G *3/00*

U.S. Cl. 109—66 **8 Claims**

1. In apparatus for dispensing documents of value, including a housing and a container for a stack of documents, the container being movable along a predetermined path into the housing up to a document feed position, and including a closure device for closing a feed aperture giving access to the stack; the combination of:

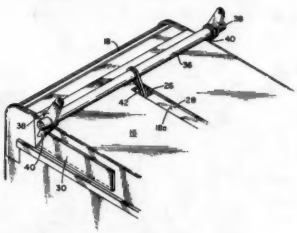
a stop member in the housing movable between a first position in which it lies in the path of the container and a second position in which it lies out of the path of the container;

an actuator in the housing, for opening the closure device during insertion of the container into the housing;

means coupling the actuator to the stop member;

the container including means for moving the stop member between its first and second positions such that when the

container is inserted, if the closure device is in a closed state the actuator engages and opens the closure device during the insertion and the coupled stop member is in its second position out of the path of the container, and if the



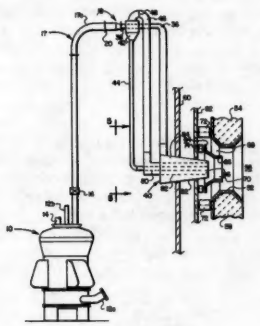
closure device is already open the actuator is prevented from such engagement and the coupled stop member is in its first position and prevents full insertion of the container.

4,570,549

SPLITTER FOR USE WITH A COAL-FIRED FURNACE UTILIZING A LOW LOAD BURNER

Norman K. Trozzi, 57 Annin Rd., W. Caldwell, N.J. 07006

Filed May 17, 1984, Ser. No. 611,241
Int. Cl.[4] F23K *1/00*
U.S. Cl. 110—106 **9 Claims**



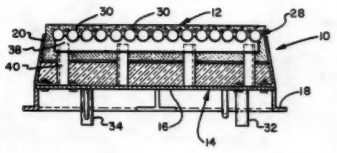
1. A splitter for directing a mixture of coal and air from an external source to a coal fired furnace, said splitter comprising a housing for receiving said mixture; an elongated damper blade assembly disposed in said housing for dividing said mixture into two streams, said damper blade assembly being pivotable at one end portion for movement in said housing to control the quantity of mixture in each of said streams, a longitudinal edge portion of said damper blade assembly being spaced from a corresponding wall of said housing in all positions of said blade assembly to define a fixed gap for the passage of a portion of said mixture; a plurality of bars; and means quick detachably connecting said bars to said damper assembly for varying the size of said fixed gap.

4,570,550

WATER COOLED DOOR

Morgan L. Wilt, Manchester, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 11, 1985, Ser. No. 753,839
Int. Cl.[4] F23M *5/08, 7/04*
U.S. Cl. 110—180 **4 Claims**



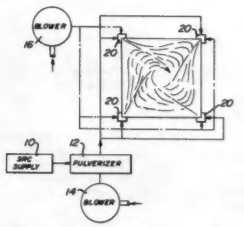
1. A water cooled door for a slagging furnace comprising:
said door having a casing side and a furnace side;
an outer casing on the casing side;
a peripheral retainer around the circumference of said outer casing and extending towards the furnace side;
a layer of insulating material adjacent to said casing and within said peripheral retainer;
a refractory layer of refractory material adjacent to said insulating material;
a tube panel comprised of a plurality of parallel water cooled tubes embedded in the furnace side of said refractory layer, and serially connected to form a water flow path; and
a multiplicity of metal studs welded to and extending from said tubes toward the furnace side, whereby slag is solidified around said studs for the purpose of protecting said refractory.

4,570,551

FIRING OF PULVERIZED SOLVENT REFINED COAL

T. Craig Derbidge, Sunnyvale, Calif.; James A. Mulholland, Chapel Hill, N.C., and Edward P. Foster, Macungie, Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Mar. 9, 1984, Ser. No. 586,907
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—263 **7 Claims**



1. A high velocity air-purged solvent refined coal burner for the firing of pulverized solvent refined coal fuel away from a hot burner surface in a furnace comprising:
an imperforate fuel tube having a relative uniform diameter throughout the length of said tube and having an inlet end and a discharge end with an end tip,
a second tube concentric with the uniform diameter of said fuel tube and cooperating therewith to define an annular passage of uniform cross-sectional dimension between said tubes having an inlet end and a discharge end,
means for supplying a mixture of air and pulverized solvent refined coal fuel to the inlet end of said imperforate uniform diameter fuel tube at a high velocity to cause said

mixture to flow through said fuel tube under flow conditions to substantially avoid impingement of said admixture on said hot burner surfaces and to provide the burner flame will be situated away from said tip of said imperforate uniform diameter fuel tube to reduce the amount that said imperforate uniform diameter fuel tube is heated by the burner flame and to prevent agglomeration of said solvent refined coal on the tip of said burner, and

means for supplying purging air to said inlet end of said second tube to cause the purging air to flow through said annular passage at a high velocity and exit said outlet end of said second tube in a path directly parallel to the exit path of said fuel admixture exiting said imperforate uniform diameter fuel tube to move said fuel away from the burner tip and to thereby cool said fuel tube and avoid agglomeration of said solvent refined coal on said burner tip.

4,570,552

PROCESS AND APPARATUS FOR DELIVERING CARBON MATERIAL TO A FURNACE

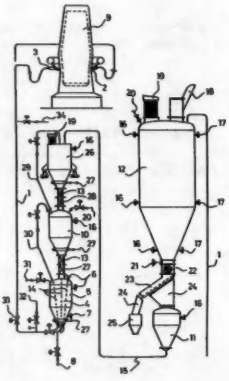
Hans-Günther Rachner, Essen, and Hans-Herrmann Boiting, Steinfurth, both of Fed. Rep. of Germany, assignors to Paul Wurth S.A., Luxembourg

Filed Jul. 19, 1984, Ser. No. 632,527

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1983, 3325901

Int. Cl.[4] F23D *1/00*

U.S. Cl. 110—347 **31 Claims**



1. A process for delivering dosed quantities of carbon to separate streams of a carrier gas under a predetermined pressure, the separate carbon/carrier gas streams being delivered to a plurality of combustion points in a furnace including the steps of:

supplying each separate carrier gas stream with an effectively high proportion of carbon material to create an essential constant density of carbon in said separate carrier gas stream;

detecting the quantity of carbon which is delivered to each combustion point based on a volumetric measurement of the carbon/carrier gas stream;

delivering a pre-selected, nominal quantity of said carbon to the plural combustion points of the furnace at an essentially supercritical speed; and

supplying a secondary carrier gas stream to said carbon/carrier gas stream to correct the quantity of carbon being delivered to said combustion points when said quantity is higher or lower than said pre-selected nominal quantity.

4,570,553

TRUCK WITH AUTOMATIC GROUND SOFTENING APPARATUS

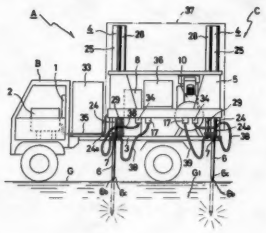
Yujiro Ito, Tama, Japan, assignor to Kowa Automobile Industrial Co, Ltd, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,469

Claims priority, application Japan, Jun. 9, 1982, 57-97600; Jun. 22, 1982, 57-106175

Int. Cl.[4] A01C *23/02*

U.S. Cl. 111—6 **2 Claims**



1. A truck with a driver's seat and a load-automatic ground softening apparatus mounted on the load-carrying platform, said apparatus capable of centralized control for operation, said ground softening apparatus including a plurality of piston-cylinder assemblies mounted in the inverted state at intervals along the opposite sides of said load-carrying platform and operable with fluid pressure and air nozzle pipes depending from the lower end of said respective piston-cylinder assemblies;

an operating panel provided aside the driver's seat for centralized control;

said automatic ground softening apparatus further including piston-cylinder assembly operating systems, one provided for each of said piston-cylinder assemblies, having a fluid pressure source and a change-over valve for on-off control of the supply of fluid pressure from said fluid pressure source to the corresponding piston-cylinder assembly;

air supply systems, one provided for each of said air nozzle pipes, having a compressor, a replenishment tank, a plurality of pressure control valves, a replenishment pressure valve, and a discharge valve for on-off control of the supply of compressed air to the corresponding air nozzle pipe;

first control circuits, each provided for one of said air nozzle pipes, having a plurality of detector switches for detecting respective vertical positions of the corresponding air nozzle pipe for controlling the switching operation of the corresponding change-over valve, and

second control circuits, each provided for controlling said pressure control valves, replenishment pressure valve and discharge valve in the corresponding air supply system.

4,570,554

ADJUSTABLE WIDTH CLOSING WHEELS FOR PLANTER ROW UNITS

Richard H. Clark, Blue Grass, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 28, 1983, Ser. No. 546,690

Int. Cl.[4] A01C *5/06*

U.S. Cl. 111—85 **3 Claims**

1. In a seed planting implement of a type including a frame adapted to be moved along the ground and having at least one seed planting unit connected to said frame, said seed planting unit including a subframe, means for forming a furrow in the soil attached to said subframe, means for depositing seeds into said furrow, furrow closing means attached to said subframe rearwardly of said seed depositing means for causing the soil on each side of said furrow to be pushed over the seeds in the

furrow, said furrow closing means including an arm pivotally attached at one end thereof to said subframe along an axis substantially transverse to the direction of forward movement of said planting implement in operation, a first and second rotatable closing wheel means for engaging each side of said furrow for pushing the soil forming each side of the furrow over the seeds in the furrow, axle assembly means attached to the other end of said arm for rotatably attaching said first and second closing wheel means to said arm, the improvement comprising:

said axle assembly means including an axle shaft, said axle shaft having a central portion, a first portion extending from said central portion along a first closing wheel means axis to a free end thereof, and a second portion extending from said central portion along a second closing wheel means axis to a free end thereof;

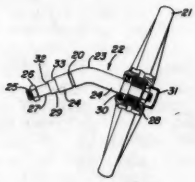
a first reduced section on the free end of said first portion of said axle shaft;

bearing means disposed on said first reduced section for reducing friction during rotation of said first closing wheel means;

a second reduced section on another part of the free end of said first portion of said axle shaft, a first shoulder on the first portion of said axle shaft separating the first reduced section from the second reduced section and a second shoulder separating the second reduced section from the remainder of said first portion of the axle shaft;

first spacing means for selectively spacing said bearing means a predetermined distance from said first shoulder;

seal means disposed on said second reduced section for sealing contaminants from said bearing means;



second spacing means for selectively spacing said seal means by a predetermined distance from said second shoulder whereby said first wheel means can selectively be spaced outwardly or inwardly by use or non-use of said first and second spacing means;

a first reduced section on the free end of said second portion of said axle shaft;

second bearing means disposed on said first reduced section of said second portion for reducing friction during rotation of said second closing wheel means;

second reduced section on another part of the free end of said second portion of said axle shaft, a first shoulder on the second portion of said axle shaft separating the first reduced section from the second reduced section of the second portion and a second shoulder separating the second reduced section from the remainder of said second portion of the axle shaft;

third spacing means for selectively spacing said second bearing means by said predetermined distance from the first shoulder of said second portion;

second seal means disposed on said second reduced section of said second portion of the axle shaft for sealing contaminants from said second bearing means; and

fourth spacing means tor selectively spacing said second seal means by a predetermined distance from said second shoulder on said second portion of the axle shaft, whereby said second closing wheel means can selectively be spaced outwardly or inwardly by use or non-use of said third and fourth spacing means.

4,570,555

DRIVE DEVICE FOR A TWO-THREADED CHAIN-STITCH BUTTONHOLE SEWING MACHINE

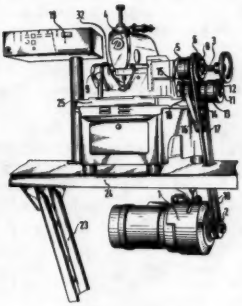
Kurt Reinke; Eberhard Kastrup, and Heinz-Rolf Oberschelp, all of Bielefeld, Fed. Rep. of Germany, assignors to Durkoppwerke GmbH, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,787

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 8330328[U]

Int. Cl.⁴ D05B *3/06, 69/10*

U.S. Cl. 112—67 **10 Claims**



1. A drive device for a double thread, chainstitch, buttonhole sewing machine, wherein the machine comprises:

a positioning drive with a rotatable first drive shaft;

a second rotatably driven shaft; movable sewing needle means connected with the second shaft for being moved thereby for sewing a buttonhole in cloth; a cloth support plate also connected with the second shaft for being moved intermittently to move cloth to be sewn to and past the needle means; a position transmitter attached to the second shaft, including a tachogenerator for indicating position of the second shaft and thereby for indicating the position of the needle means;

a first electromagnetic clutch on the second shaft, incluuding a first armature part which is rotable relative to and around the second shaft; a first drive connection between the first shaft and the first armature part, whereby rotation of the first shaft rotates the first armature part;

a third shaft rotatably supported in the machine; a second electromagnetic clutch on the third shaft, including a respective second armature part which is rotatable relative to and around the third shaft and which is connected with the first armature part to rotate with the first armature part;

a fourth shaft rotatably supported in the machine and connected with the cloth support plate for moving the plate from a position away from a sewing position to the sewing postion at the needle means; the fourth shaft also being connected with a knife for cutting open a buttonhole in the cioth; a driving connection between the third and fourth shafts for these shafts to rotate together.

4,570,556

AUTOMATIC SEAMING METHOD AND APPARATUS FOR GORED PANTY-HOSES

Rikichi Senba, Osaka, Japan, assignor to Senba Machinery Co. Ltd., Japan

Filed Mar. 17, 1980, Ser. No. 130,850

Claims priority, application Japan, Mar. 16, 1979, 54-031570

Int. Cl.⁴ D05B *21/00, 3/12*

U.S. Cl. 112—121.15 **11 Claims**

1. Automatic seaming apparatus for gored panty-hoses comprising

a horizontal operation table having at least four separate

operation stations arranged along a given circulating path of travel at substantially equal intervals,

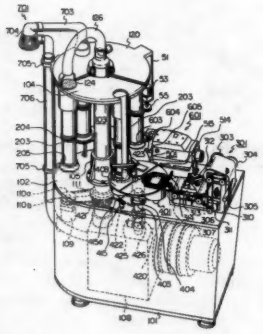
at least four suction assemblies arranged over said operation table, and each adapted for holding an incomplete panty-hose, each including a vertical suction tube provided with a bottom flange and at least one inner hook,

means for concurrently driving said four suction assemblies for travel from station to station along said path of travel in an intermittent fashion with dwells so that each said suction assembly rests at any station during said dwells,

a gore piece feeder assembly arranged facing a second station and adapted for sequentially feeding gore pieces of a prescribed pattern, one at a time, in an intermittent fashion,

a gore piece transfer assembly interposed between said second station and said feeder assembly and adapted for transferring, in a horizontal state, each said gore piece fed by said feeder assembly to each said suction assembly located at said second station during each said dwell,

a heat cut assembly arranged facing said second station and adapted for forming at least one longitudinal cut in the sliced fringe of each said incomplete panty-hose held by said suction assembly,



means for flattening said sliced fringe of said incomplete panty-hose into a superimposed state with the fringe of said gore piece,

a flat guide plate extending between said second and a third station and flush with the bottom face of said gore piece superimposed with said fringe of said gore piece,

a suction tube driver assembly arranged in said third station and adapted for driving said suction tube of said suction assembly in said third station for a 360 degrees rotation,

a sewing machine arranged in said third station, provided with a sewing table flush with said guide plate, and adapted for seaming said two superimposed fringes together during said 360 degrees rotation in order to form a completed gored panty-hose during each said dwell,

a removing assembly arranged facing a fourth station and adapted for removing, by means of pneumatic suction, said complete gored panty-hose off said suction assembly located at said fourth station, and

a pneumatic suction source connected to said transfer assembly, removing assembly and each said suction assembly located at said first station.

4,570,557

APPARATUS FOR FOLDING AND REINFORCING AN EDGE PORTION OF FABRICS

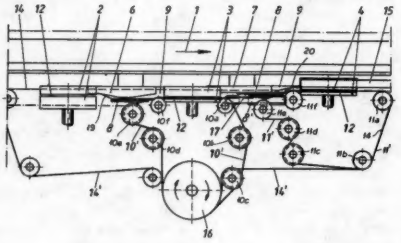
Johannes Freermann, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale GmbH & Co. KG, Ochtrup, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,126

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336356

Int. Cl.[4] A41D *35/02*

U.S. Cl. 112—147 **16 Claims**



1. An apparatus for folding and reinforcing an edge portion of a continuous fabric, comprising:

a first and a second roll unit for pressing the edge portion along a contact plane while simultaneously transporting the fabric, said roll units being spaced from each other in conveying direction;

a press pad arranged between said two roll units adjacent the edge portion for exerting a pressure on the remaining portion of the fabric passing thereunder so as to keep the fabric in position; and

at least one folding unit arranged between said two roll units and including a first conveyor along the edge portion remote to the remaining portion of the fabric and having a section directed inwardly toward the edge portion so as to cross the conveying path of the edge portion before being pressed by said second roll unit, and a second conveyor located beneath the passing edge portion and extending beyond said contact plane, said conveyors cooperating with each other such that the edge portion is lifted by said second conveyor and then engaged by said section of said first conveyor so that the edge portion is upwardly bent and folded by the inward motion of said section of said first conveyor.

4,570,558

OVERLOCK SEWING MACHINE HAVING LOOPING WIDTH ADJUSTING MECHANISM

Tetsuro Hirayama, Chofu; Masayuki Oikawa, Niiza, and Ichirou Horie, Fujimi, all of Japan, assignors to Juki Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 546,835

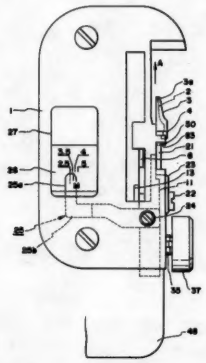
Claims priority, application Japan, Oct. 29, 1982, 57-164298[U]; Nov. 30, 1982, 57-210494; Aug. 24, 1983, 58-130921[U]

Int. Cl.[4] D05B *1/20*

U.S. Cl. 112—162 **12 Claims**

1. An overlock sewing machine having a machine body comprising: a looping width adjusting mechanism having a throat plate over which a cloth is fed and a stationary claw integral with said throat plate and directed in the direction of movement of the feed of said cloth; a movable claw separate from said throat plate and disposed in a side-by-side relation to said stationary claw and directed in the same direction as said stationary claw; a cutter blade holder mounted on the machine body and carrying said movable claw such that said movable claw can be moved towards and away from the side of said stationary claw; a lower cutter blade carried by said cutter

blade holder; an upper cutter blade disposed for sliding contact with said lower cutter blade; a movable member having a finger retainer and movably mounted on said cutter blade holder so as to cause the movement of said movable claw between an operative position adjacent to the side of said stationary claw and an inoperative position spaced away from said side of said stationary claw; a dial having rotary motion and a conversion means for converting a rotary motion of said dial into a linear motion thereby causing the movement of said



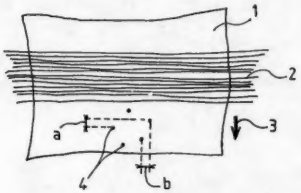
movable claw toward and away from the side of said stationary plate; wherein the improvement comprises that said dial and said conversion means are associated with said cutter blade holder so as to cause a movement of said cutter blade holder, whereby the adjustment of the distance between said stationary claw and said movable claw is effected by a linear movement of said cutter blade holder in the direction perpendicular to the direction of feed of said cloth caused by a rotation of said dial.

4,570,559

METHOD OF IMPLANTING HAIR ON A SHEET SUPPORT

Patrick Buteux, 107, rue du Gé76000 Rouen, and Pierre Buteux, "Le Bois Tison" Saint-Jacques Sur Drnetal, 76160 Darnetal, both of France

Filed Oct. 16, 1984, Ser. No. 661,406
Claims priority, application France, Oct. 25, 1983, 83 16972
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—266.2 **7 Claims**



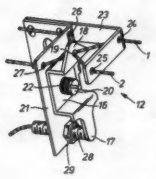
1. A method of implanting hairs on a sheet support, the method comprising the steps of: laying the hairs flat and parallel on the sheet in a dense lock; stitching the hairs to the sheet by means of a plurality of needles each having a tip which passes through the sheet entraining a bight of a hair to form a hair loop under the sheet, the said needles being offset from one another in a direction perpendicular to the parallel hairs to prevent any two needles from entraining the same hair on the same stitching stroke; and fixing the said looped bights of hair under the same sheet.

4,570,560

STOP MOTION DEVICE FOR SEWING, EMBROIDERING OR TUFTING MACHINES

Heinz Hubele, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,707
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 8410845[U]
Int. Cl.[4] D05C *11/14;* **B65H** *63/02*
U.S. Cl. 112—273 **9 Claims**



1. A stop motion device for a machine using a plurality of threads which are fed under tension in a feed direction during machine operation, comprising:

switch means which are actuatable to stop the machine operation;

a fixed thread deflection guide for guiding the threads; and

a sensing lever pivotally mounted with respect to said guide about an axis which is substantially parallel to the feed direction of the threads, said lever having a sensing arm for guiding the threads and a switching arm associated with said switch means for actuating said switch means with movement of said lever;

one of said sensing arm and guide having a first thread guiding portion for guiding all the threads in their feed direction and the other of said sensing arm and guide having two second thread guiding portions spaced from said first thread guiding portion in the feed direction and offset from said first thread guiding portion in a direction transversely to said feed direction, on opposite sides of said first guiding portion, at least one thread being guided in each of said second thread guiding portions whereby with movement of said threads under tension in said feed direction, said lever is held in a sensing position and, with rupture of one thread, said lever is pivoted away from said sensing position so that said switching arm actuates said switch means to stop the machine operation.

4,570,561

ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa, and Takeshi Kongoh, Tokyo, both of Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,327
Claims priority, application Japan, Apr. 22, 1983, 58-70004
Int. Cl.[4] D05B *97/04, 3/02*
U.S. Cl. 112—454 **3 Claims**

1. An electronic sewing machine of the type having a rotatable drive shaft to reciprocate vertically a laterally swingable needle for penetrating a fabric to be sewn and form stitches thereon, comprising:

a first electronic memory for storing stitch control data to control the needle position and a fabric feed amount per stitch of a pattern selected from a number of different patterns including a darning pattern, said darning pattern being comprised of plural series of straight stitch lines sequentially and alternately produced in forward and reverse fabric feeding directions, said stitch lines being

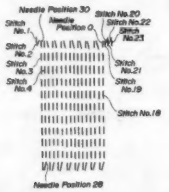
laterally spaced from each other by a predetermined distance within a maximum range which said needle can swingably traverse, said stitch control data including first data defining a fixed number of stitches at initial and final portions of said darning pattern and second data defining said straight stitch lines each of which can be produced continuously as long as the sewing machine is driven;

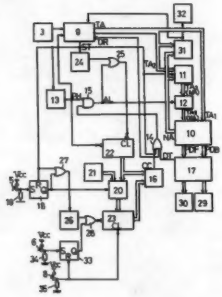
pattern selecting means including a pattern selecting switch operative to produce a pattern signal designating said darning pattern;

pattern signal control means responsive to said pattern signal to latch the same and produce a start signal and an initial address signal for addressing said memory, to read out sequentially the data for said selected pattern;

pulse signal generating means operated in synchronism with rotation of said drive shaft to produce a timing signal for reading out the data of the selected pattern from said memory;

counter means responsive to said start signal and adapted to be reset to count a number of said timing signals produced by said pulse signal generating means;





data discriminating means operated in response to said first data to produce a signal for making effective each timing signal of said pulse signal generating means, said data discriminating means being responsive to said second data to produce a signal for nullifying said timing signal to said memory and simultaneously resetting said counter means for starting the counting operation;

switch means operated to designate a turning point of each series of said straight stitch lines of said darning pattern;

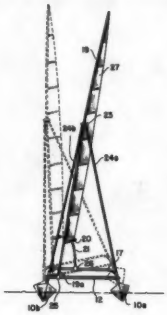
a latch circuit responsive to operation of said switch means to latch the number of said timing signals counted by said counter means; and

means for comparing said number of timing signals latched by said latch circuit and a number of said timing signals counted by said counter means, said comparing means being operated when the counted number coincides with the latched number to make effective said timing signal to said memory, and simultaneously to reset said counter means for starting the count operation.

4,570,562
LIGHT SAILING VEHICLE WITH MOVABLY MOUNTED MAST

Jean-Paul Dudouyt, Les Ca elias, Place des Palmiers, 44500 La Baule Les Pins, France

Filed Jun. 10, 1983, Ser. No. 503,125
Claims priority, application France, Dec. 20, 1982, 82 21332
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—39 **4 Claims**

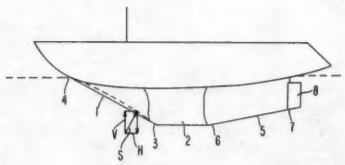


1. A vehicle equipped with a frame including a plurality of parallel cross members including a front and back cross member, oppositely disposed parallel longitudinally extending rods joined to said plurality of cross members, a mast secured at one end to said front cross member, at least one sail fixed on said mast and attached on a boom having a trailing portion including a tack, a two-legged support means forming an inverted V, said two-legged support means mounted at a lower end thereof for slidable movement on said oppositely disposed longitudinally extending rods, said mast being supported for articulation approximately at its middle part by an upper end of said two-legged support means, and at its lower end in such a manner as to assume a longitudinal position which is regulatable in order to vary the rake of the mast, and said mast includes a foot having roller means arranged to roll along said front cross member mounted forward of said longitudinally extending rods to thereby enable said mast to move laterally along said front cross member and the trailing portion of said boom is guided along a control means.

4,570,563
GROUNDING PROTECTIVE DEVICE FOR BOATS

Stig Stenlund, Saltsjöbaden, Sweden, assignor to Hypeco AB, Alvsjö , Sweden

PCT No. PCT/SE83/00235, § 371 Date Feb. 7, 1984, § 102(e) Date Feb. 7, 1984, PCT Pub. No. WO83/04400, PCT Pub. Date Dec. 22, 1983
PCT Filed Jun. 8, 1983, Ser. No. 589,076
Claims priority, application Sweden, Jun. 8, 1982, 8203550
Int. Cl.[4] B63B *59/02*
U.S. Cl. 114—140 **8 Claims**



1. A device for protecting sailing and similar vessels having

a fixed fin keel when running aground or hitting objects, comprising:

an elongated stay attached at one end to the leading edge of the keel at the lowermost end thereof and extending therefrom in a longitudinal direction and attached at the other end to the stem edge of the hull of the vessel;

said stay being positioned with respect to the vessel so that any point on said stay between said ends is at least as deep as any part of the vessel between said ends of the stay lying in the same substantially vertical plane as said point; and

said stay being elastically or plastically extendable a predetermined extent to absorb shock forces due to impact of objects thereon sufficiently to prevent damage to the keel, hull and attachments at said ends of said stay.

4,570,564

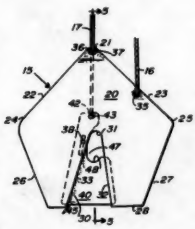
RAT GUARD

Robert M. Salvarezza, 110 Braemar Dr., Hillsborough, Calif. 94010

Filed Oct. 26, 1984, Ser. No. 665,121

Int. Cl.⁴ B63B *21/12*

U.S. Cl. 114—221 R **15 Claims**



1. A rat guard for ships' hawsers and the like, including in combination:

a large barrier plate having an upper end, side edges, and a lower edge and having a main open-end slot leading upwardly from said lower edge toward an arcuate hawser-engaging end near the center of gravity of said plate, said plate also having a through opening near said upper end and said plate having a pivot pin near the upper end of said main slot,

a freely swingable closure door larger and heavier at a lower end portion and having an upper end portion with a recess extending in from one side edge and having an arcuate portion for engaging said hawser on its side opposite the arcuate end of said main slot, said door having a closed rectilinear slot receiving said pivot pin so that said door is slidable without rotation relative to said plate and pin as well as being pivoted to said pin, said door having first rope-anchoring means adjacent to its upper end,

one of said door and plate having second rope anchoring means well below its upper end and near one side thereof,

a first control rope extending through said through opening and secured to said first rope-anchoring means, for lowering said guard from deck down toward a hawser, and

a second control rope secured to said second rope-anchoring means,

said ropes serving for aligning said main slot with said hawser and opening said door so that the lowered guard engages said hawser at the arcuate upper end of said slot, and for righting said guard and causing said door to close said main slot by pivoting and sliding relative to said pivot pin and to engage said hawser with said arcuate portion.

4,570,565

METHOD AND CIRCUIT ARRANGEMENT FOR PROVIDING DATE AND TIME INFORMATION IN A TELEX AND DATA SWITCHING SYSTEM

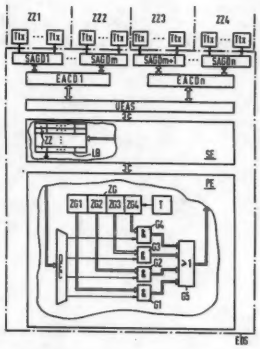
Peter Mürawski, and Wolfgang Mayer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,659

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334529

Int. Cl.⁴ H04L *13/08*

U.S. Cl. 178—2 R **5 Claims**



1. A method for providing date and time information in a telex and data switching system connected with subscriber stations that are located in different time zones where the date and time information is transmitted at least to the calling subscriber station during the course of the establishing a connection, said method comprising the steps of:

(a) storing data in said telex and data switching system representing the time zone of each one of said subscriber stations;

(b) making available, on a continuous basis in said telex and data switching system, current date and time information for each different time zone in which said the subscriber stations are located;

(c) when establishing a connection between subscriber stations, selecting the current date and time information of at least the calling subscriber station by means of said data representing the time zone of said calling station; and

(d) transmitting the selected date and time information at least to said calling station.

4,570,566

APPARATUS FOR PRODUCING ELASTOMER-COATED BIAS REINFORCEMENT FABRIC

Delmar D. Long, Rock Hill, S.C., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 350,969, Feb. 22, 1982, Pat. No. 4,501,771. This application Jul. 6, 1984, Ser. No. 628,673

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.⁴ B05C *1/08, 3/132, 11/04*

U.S. Cl. 118—34 **21 Claims**

1. In an apparatus for manufacturing an elastomer coated, bias fabric which comprises:

a. means for moving a bias cut fabric in a generally horizontal path of travel,

b. means for immersing said fabric in an elastomer composition as it moves along said path of travel, so as to impregnate the yarn bundles in said fabric with said elastomeric composition,

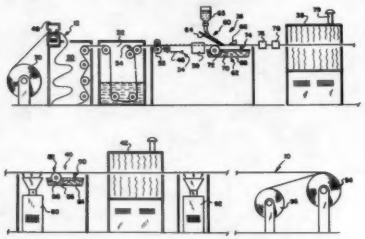
c. means for transversely stretching said fabric and maintain-

ing said fabric in a stretched condition, said means being positioned downstream of said means for immersing said fabric and being operative as said fabric moves along said path of travel and as said fabric is coated with an elastomeric composition and said elastomeric composition is dried,

d. a first applicator means positioned beneath and extending across said path of travel for continuously applying a layer of an elastomeric composition to the bottom surface of said fabric as said fabric moves along said path of travel,

e. a second applicator means positioned above and extending across said path of travel for continuously applying a layer of an elastomeric composition to the top surface of said fabric as it moves along said path of travel,

f. a first scraper means positioned beneath said path of travel and downstream of said first and second applicator means and extending across said path of travel for continuously



smoothing the layer of elastomeric composition on the bottom surface of said fabric to the desired thickness and removing excess composition, and

g. a first drying means positioned immediately downstream of said first scraper means for drying said coated fabric; the improvement which comprises:

h. a third applicator means positioned downstream of said first drying means and extending across said path of travel for continuously applying a layer of a tackified elastomeric composition to only one surface of said fabric in a non-pressurized manner as said fabric moves along said path of travel,

i. a second scraper means extending across said path of travel and downstream of said third applicator means for continuously smoothing said layer of tackified elastomeric composition on said one surface of said fabric to the desired thickness and removing excess composition, and

j. means for collecting said coated fabric.

4,570,567

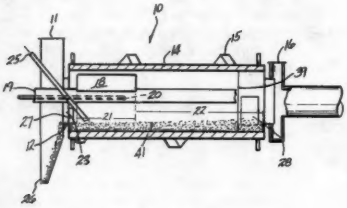
AIR CLASSIFICATION IN A SPRAY GRAINER

William G. Bridges, Athens, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Filed Sep. 30, 1983, Ser. No. 538,024

Int. Cl.⁴ B05B *15/00*

U.S. Cl. 118—64 **11 Claims**



1. In a rotary drum spray grainer for producing spray grained product particles having a hot air inlet means adjacent a first end feeding in hot air in a first direction, air outlet means adjacent an opposing second end for removing the exhaust air, product seed particle inlet means entering the drum downstream of the first end for feeding in seed particles, spraying means extending at least partially between the hot air inlet means and the air outlet means defining a spraying zone for spraying the particles, a drying zone intermediate the spraying zone and the second end, recycle means for recycling undersized product particles back into the drum, and means to rotate the drum, the improvement comprising in combination:

a. product outlet means adjacent the first end of the drum; and

b. a classification zone adjacent the first end of the drum positioned between the hot air inlet means and the spraying zone so that the product particles must pass therethrough in a second direction counter-current to the first direction of the inlet hot air so that the undersized particles are forced back into the rotary drum spray grainer for more spraying while the full-sized particles pass out into the product outlet means.

4,570,568

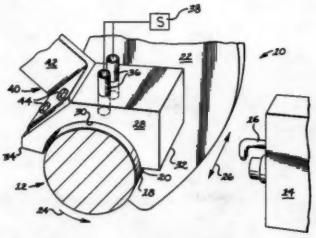
SHROUD FOR THERMALLY SPRAYED WORKPIECE

Jack E. Fair, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1984, Ser. No. 684,414

Int. Cl.⁴ B05B *7/20, 15/04*

U.S. Cl. 118—69 **3 Claims**



1. In an apparatus for thermally depositing a coating on a shaft including a means spaced from the shaft for melting a material and propelling the molten material to a surface area on the shaft, means for directing a flow of gas at the coated surface area of the workpiece, and means for rotating the workpiece, the improvement comprising:

a shroud having a semi-cylindrical inner surface spaced from the coated surface of the shaft, a first edge extending along the shaft adjacent said surface area, a second edge spaced from the first edge in the direction of rotation of the shaft, whereby the shroud covers the newly coated area of the shaft; and

conduit means for delivering a flow of gas from a source of pressurized gas to the inner surface of said shroud.

4,570,569

SOLDERING APPARATUS

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,941

Claims priority, application Japan, Nov. 14, 1983, 58-212358; Nov. 14, 1983, 58-212359; Nov. 14, 1983, 58-212360

Int. Cl.⁴ B05C *3/02*

U.S. Cl. 118—410 **7 Claims**

1. An apparatus for coating terminal leads of electrical components with solder, comprising:

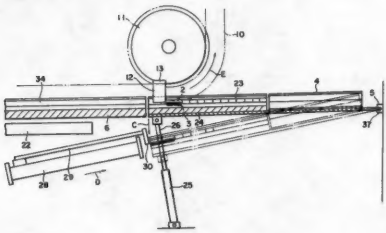
at least one pair of container means each having a support

member adapted for supporting thereon a plurality of electrical components in a row;

a series of work stations including a soldering station wherein the terminal leads of each electrical components are brought into contact with molten solder, said stations being arranged in a straight path and having track means extending adjacent thereto, corresponding in number to the number of said pair and adapted for supporting the electrical components thereon in a manner so that the electrical components placed thereon can be displaced therealong when urged in the direction parallel to the track means;

a first platform provided adjacent to one end of said track means and adapted for supporting thereon respective one of the container means of each pair at a feed location;

first operating means for operating the row of electrical components on the support member of each container means placed at said feed location on said first platform to displace the row of electrical components to a start position on associated track means;



moveable rail means provided adjacent to the other end of said track means, adapted for supporting thereon the electrical components and each moveable between a first position at which the row of electrical components on associated track means may be transferred thereto and placed at a terminal position;

driving means for displacing the row of electrical components supplied at the start position on each track means through the series of work stations to the terminal position on associated moveable rail means positioning at said first position;

a second platform provided adjacent to said moveable rail means and adapted for supporting thereon the other one of container means of each pair at a receipt location;

second operating means for operating the row of electrical components supplied at the terminal position on each moveable rail means at said second position to displace same on the support member of associated container means placed at said receipt location on said second platform; and

means for displacing said moveable rail means between said first and second position.

4,570,570

MIXING DEVICE FOR PARTICULATE MATERIAL

Roger D. Masham, Ashwell, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 24, 1984, Ser. No. 613,681

Claims priority, application United Kingdom, Jun. 8, 1983, 8315725

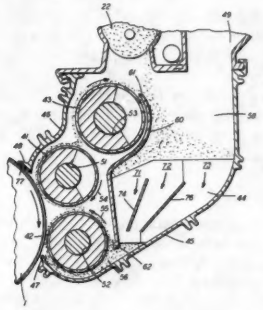
Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—612 **8 Claims**

1. An apparatus for mixing flowing developer material, including:

at least one dividing plate; and

a plurality of spaced vanes projecting outwardly from said dividing plate, said vanes and said dividing plate defining a plurality of sets of chambers arranged in substantially parallel rows with each chamber being arranged to receive developer material at an entrance aperture and to release the developer material from an exit aperture, each chamber having its exit aperture displaced from a position vertically below its entrance aperture, each row having an alternate series of chambers with their exit apertures spaced respectively to the left and right of the position



vertically below their entrance apertures and the entrance apertures and exit apertures of the chambers of different rows being aligned so that on successive recirculations of the developer material the developer material moves simultaneously from left to right and from row to row, and from right to left and from row to row.

4,570,571

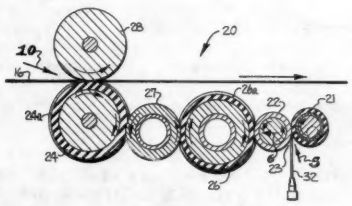
APPARATUS FOR APPLYING UV INK TO GLASS FIBERS

Earl M. Seagrave, and Edmond H. Machen, both of Charlotte, N.C., assignors to Fusion UV Curing Systems Corporation, Rockville, Md.

Filed Jul. 12, 1984, Ser. No. 630,007

Int. Cl.[4] B05C *1/08*

U.S. Cl. 118—642 **14 Claims**



8. An applicator apparatus for applying a coating of a viscous ink to a moving strand, said apparatus comprising

a series of rotatable rollers successively arranged in driving engagement with peripheral surfaces of adjacent rollers in contact,

said series of rollers including a first roller at one end of the series having its peripheral surface positioned in engagement with a second roller of the series to define an ink receiving nip,

said series of rollers also including an applicator roller at the opposite end of the series from said first roller adapted for applying the ink coating to the strand,

at least one of the rollers in said series having its peripheral surface formed of a resilient elastomeric material and having a circumferentially extending concavity formed in the peripheral surface, and wherein the concave peripheral surface thereof tightly engages the peripheral surface

of the adjacent roller so that upon rotation of the roller said concavity is flattened as it passes through the nip and returns to its concave configuration upon leaving the nip whereby the ink which is deposited on the peripheral surface of the ink positioning roller is centered in the circumferentially extending concavity.

means for directing the viscous ink into said ink receiving nip,

means for rotating the rollers of the series for thereby successively transferring the ink from said ink receiving nip along the peripheral surfaces of each of the rollers in the series and to said applicator roller, and

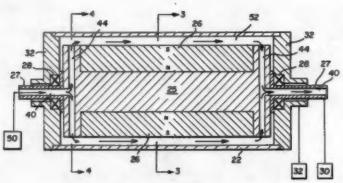
means for directing the moving strand substantially tangentially across the surface of the applicator roller to thereby apply a substantially uniform coating of the ink to the strand.

4,570,572

ELECTROGRAPHIC DEVELOPMENT APPARATUS

Kelly S. Robinson, Rochester; Richard A. Weitzel, Hilton, and Arthur S. Kroll, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1985, Ser. No. 717,257
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 118—657 **8 Claims**



1. In an electrographic development apparatus for applying a magnetically attractable developer to an electrostatic charge pattern on a support, said apparatus comprising a hollow nonmagnetic sleeve, a magnetic field-producing means disposed within said sleeve for magnetically attracting developer to the sleeve's outer surface, and means for imparting relative motion between said sleeve and said magnetic field-producing means to transport developer toward and away from a development zone at which is applied to a charge pattern to effect development thereof, the improvement comprising means for cooling the developer whilst being transported by said apparatus.

4,570,573

COMPOSITION USEFUL AS A CAT LITTER, PLANT MULCH, OR GREASE AND OIL ABSORBENT

Donald J. Lohman, Cincinnati, Ohio, assignor to Cincinnati Fiber Inc., Cincinnati, Ohio

Filed Oct. 18, 1984, Ser. No. 662,190
Int. Cl.⁴ A01K *1/015*
U.S. Cl. 119—1 **7 Claims**

1. A composition which is useful as a cat litter comprising about 60–94% by weight paper as an absorbent, about 1–35% by weight gypsum as a neutralizing agent, and about 3–12% by weight water.

4,570,574

CAGE DOOR FOR EASY ONE-HAND OPERATION

Harvey Z. Burkholder, Denver, Pa., assignor to USI Agri-Business Company Inc., New Holland, Pa.

Filed Nov. 26, 1984, Ser. No. 674,930
Int. Cl.⁴ A01K *31/10*
U.S. Cl. 119—17 **17 Claims**

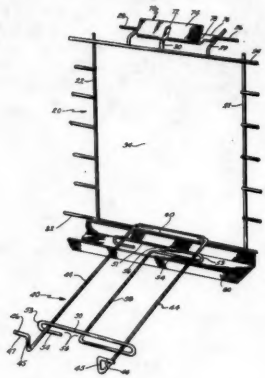
1. A door for use with cages having a door opening in one side thereof, said door opening having a base and a top comprising:

a pair of resilient, elongated legs extending between said base and top;

means for pivotally securing said legs to the base of said door opening, whereby said legs can be selectively positioned over or away from said door opening;

said cage having receiving means above said door opening;

engaging means connected to the free ends of said legs for engaging with said receiving means, said engaging means being adapted to be engaged with said receiving means when said legs are positioned over said door opening, said legs being resiliently deformable with respect to each



other to releasably disengage said engaging means from said receiving means;

locking means hingedly connected to said cage for pivotal movement to a locking position between said legs for preventing the deformation of said legs when said engaging means are engaged with said receiving means, said locking means thereby locking said engaging means into engagement with said receiving means when said gate is positioned over said door opening, said locking means being pivotal to a position out of said locking position between said legs for permitting an operator to deform said legs to releasably disengage said engaging means from said receiving means to open said door.

4,570,575

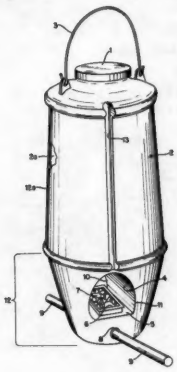
COMBINED BIRD FEED CONTAINER AND BIRD FEEDER

Carl H. Hinz, Nonnenwaldweg 32, D-6229 Schlangenbad-Georgenborn, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,268
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320833
Int. Cl.⁴ A01K *39/00*
U.S. Cl. 119—52 R **15 Claims**

1. A combined bird feed container and bird feeder, comprising an elongated hollow housing arranged to store a supply of feed and including an upper portion and a lower portion, said lower portion having at least one transverse tunnel and walls surrounding said tunnel and including a bottom wall which is readily penetrable to provide an opening affording access to the feed in the interior of the lower portion of said housing, said bottom wall having a rim surrounding said opening to protect the feed from elements and said upper portion including a cover which is removable to provide an inlet for admission of feed into the interior of the housing; and a rod-like perch, said housing having means for detachably supporting said perch and said supporting means including an elongated

groove which extends substantially longitudinally of said housing and wherein the perch can be held by friction, said supporting means further including a substantially circumferentially



extending projection provided on said housing and having a notch disposed in line with said groove and arranged to receive a portion of the perch when the latter is held in said groove.

4,570,576

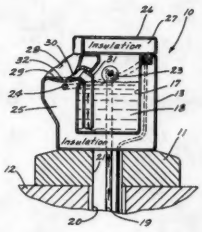
ANIMAL WATERING CUP APPARATUS

Wayne B. Noland, 5645 SE. Maple, and Larry F. Noland, 5645 SE Maple, both of Carlisle, Iowa 50047

Filed Mar. 7, 1984, Ser. No. 587,122

Int. Cl.[4] A01K *7/00*

U.S. Cl. 119—73 **14 Claims**



1. An apparatus for watering animals comprising:

a housing;

means for providing a reservoir of water within said housing;

means for receiving the mouth of an animal, said mouth receiving means having an opening therein;

draw tube means including a continuously open passageway extending from said opening and downwardly into a lower portion of said reservoir for permitting an animal having its mouth on such mouth receiving means to suck water from said reservoir, through said draw tube means and said opening into its mouth, whereby the water in the reservoir will constantly be available for drinking but will be isolated from outside ambient temperatures and dirt; and

means connected to a water source for automatically maintaining a predetermined amount and level of water in said reservoir, said level being below said opening except when an animal is drinking therefrom, and said water source being located exteriorly of said housing.

4,570,577

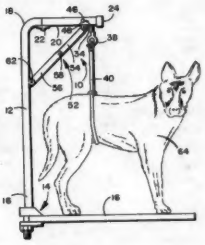
UNIVERSAL ANIMAL GROOMING POST

Gary R. Bellinger, 9635 Rosecrans Ave., Bellflower, Calif. 90706

Filed Jun. 26, 1984, Ser. No. 624,908

Int. Cl.[4] A01K *1/04*

U.S. Cl. 119—102 **5 Claims**



1. A universal animal grooming post comprising a hollow standard adapted for mounting to project upwardly from a fixed, elevated top of an animal grooming table, a hollow arm projecting laterally from said standard, a tether having an inelastic portion and an elastic portion joined together, wherein said elastic portion is secured within said standard and said inelastic portion passes within said arm that extends therefrom, and manually actuatable locking means located on said arm and engageable with said inelastic portion of said tether to longitudinally immobilize said tether so that only a selected length of said inelastic portion of said tether extends from said arm while said locking means remains engaged despite longitudinal force on said inelastic portion of said tether and said locking means is releasable to allow said elastic portion of said tether to draw said inelastic portion thereof towards said arm, and wherein said locking means includes guide means for forming a longitudinal opening of cross section reduced from that of said hollow arm wherein said inelastic portion of said tether passes through said longitudinal opening, and clamping means for acting transversely against said inelastic portion of said tether at said longitudinal opening.

4,570,578

METHOD AND DEVICE FOR OPERATING A HYDROGEN MOTOR

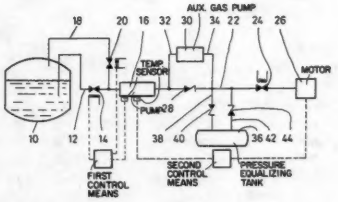
Walter Peschka, Sindelfingen; Gottfried Schneider, and Willi Nieratschker, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Nov. 21, 1984, Ser. No. 673,997

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342582

Int. Cl.[4] F02B *75/12*

U.S. Cl. 123—1 A **9 Claims**



1. Method for operating a hydrogen motor with cryogenically stored hydrogen comprising conveying hydrogen to the hydrogen motor driven by fuel injection via a pump which is

cooled to an operating temperature which is in the range of the boiling point of hydrogen, cooling the pump, at a higher temperature than its operating temperature,

by passing cold hydrogen gas through the pump until the operating temperature is attained and driving the hydrogen motor with the hydrogen gas which has passed through the pump, in a partial-load range.

4,570,579

VAPOR COOLED INTERNAL COMBUSTION ENGINE COOLANT JACKET

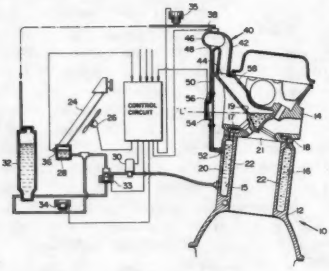
Yoshinori Hirano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 25, 1984, Ser. No. 654,222

Claims priority, application Japan, Sep. 27, 1983, 58-176889

Int. Cl.[4] F01P *3/22, 5/10*

U.S. Cl. 123—41.02 **10 Claims**



1. In a cooling system for a device having a structure subject to heating

a coolant jacket formed about said heated structure and into which coolant is introduced in liquid form and permitted to boil:

a manifold in fluid communication with said coolant jacket for receiving the vapor generated within said coolant jacket by the boiling of said coolant, said manifold including a runner which leads from a vapor outlet port of said coolant jacket to a collection chamber;

a radiator in fluid communication with said coolant jacket and arranged to condense the vapor produced by the boiling of said coolant therein to its liquid form;

a structure defining a passage which leads from the lowest level of said collection chamber, which bypasses said vapor outlet port and which merges with said coolant jacket at a first predetermined level; and

a level sensor disposed in said passage structure at a second level which is higher than said first level and said heated structure.

4,570,580

MULTIPLE PISTON EXPANSION CHAMBER ENGINE

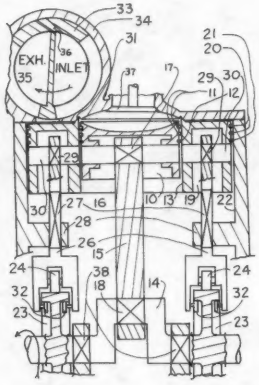
Francis W. Jackson, 409 Penwyn Rd., Wynnewood, Pa. 19096

Continuation-in-part of Ser. No. 647,842, Sep. 6, 1984, and a continuation-in-part of Ser. No. 326,902, Dec. 2, 1981, Pat. No. 4,489,681. This application Dec. 31, 1984, Ser. No. 688,954

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 B **6 Claims**

1. An internal combustion engine comprising a cylinder with an auxiliary piston reciprocating in the cylinder, a working piston reciprocating within the auxiliary piston, an auxiliary chamber above said auxiliary piston, a combustion chamber above said working piston and means providing a dwell of said auxiliary piston at TDC starting from when the working piston is between 40 degrees before to about TDC and on passing TDC entering an expansion stroke; said auxiliary piston remaining at TDC until when the working piston expansion stroke is underway and at a point where said working piston is between 20 and 160 degrees past TDC during said expansion stroke at which said point said auxiliary piston leaves TDC and moves toward BDC; means controlling communication of said combustion chamber with said auxiliary chamber to prevent communication of combusted products from said combustion chamber above said working piston to said chamber above said auxiliary piston while said auxiliary piston is at TDC and to



permit communication only during said working piston expansion stroke continuing past said point between 20 and 160 degrees past TDC and a following exhaust stroke of said working piston so as to utilize energy of expansion from said auxiliary piston as it expands until said working piston has passed through BDC and returns to about TDC during said exhaust stroke of said working piston.

4,570,581

DEVICE FOR REGULATING THE AXIAL POSITION OF A VARIABLE-PROFILE CAMSHAFT, IN PARTICULAR, FOR CONTROLLING THE TIMING SYSTEM ON AN ENGINE

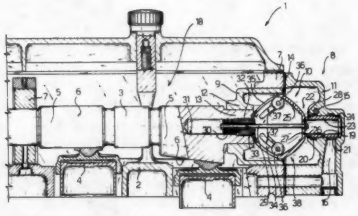
Andrea Titolo, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jan. 25, 1984, Ser. No. 573,873

Claims priority, application Italy, Feb. 4, 1983, 67126 A/83

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.18 **5 Claims**



1. A device for regulating the axial position of a variable-profile camshaft, which moves axially along its axis of rotation and which is provided with cams for engaging valve tappets, said cams having a profile which varies linearly along said axis of rotation for controlling the timing system on an internal combustion engine, the valve opening on the engine varying in constant proportion with the speed of the engine, said device comprising in combination:

(a) a hydraulic cylinder comprising a pressure chamber

provided within the cylinder head of the engine coaxial with said camshaft, and a cup-shaped piston enclosing one side of said pressure chamber and integrally arranged on the end of said shaft which is subject to the axial strain transmitted between said cams and said tappets;

(b) a sliding pressure control valve for said pressure chamber comprising a hydraulic case housed in a recess of said pressure chamber, in which a supply duct and a drain duct communicate with said pressure chamber, whereby said pressure chamber is respectively filled with and emptied of pressurized oil; and

(c) control means for controlling said pressure control valve arranged to act in response to a change in the angular speed of said camshaft, said control means in turn comprising:

(i) a first forkpiece (**34**) housed inside said pressure chamber and connected integrally with said end of said camshaft which is subject to the axial strain transmitted between said cams and said tappets, said first forkpiece being provided with slots, skewed in relation to the axis of translation of said piston and in which rotary masses are housed and slide, said slots being arranged to force said rotary masses to move axially towards said recess as said rotary masses move radially away from the axis of rotation of said camshaft, and to move towards said end of the camshaft which is subject to strain transmitted between said cams and said tappets as said rotary masses move radially toward said axis of rotation;

(ii) a second forkpiece (**25**) housed inside said pressure chamber, facing toward said first forkpiece and rigidly affixed with respect to said hydraulic case, said second forkpiece being shaped so as to cooperate with said first forkpiece and to engage said rotary masses; and

(iii) a link connecting said second forkpiece to a spring housed in a bore provided in said end of the camshaft which is subject to strain transmitted between said cams and said tappets, said spring being arranged to slide said hydraulic case towards said piston so as to urge said second forkpiece into contact with said rotary masses.

4,570,582

INNER ELEMENT FOR A HYDRAULIC VALVE PLAY COMPENSATING ELEMENT

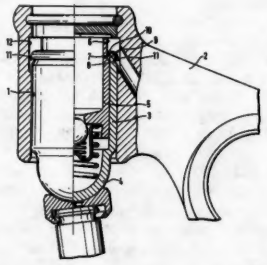
Walter Speil, Ingolstadt, Fed. Rep. of Germany, assignor to Motomak Motorenbau, Machinen-und Werkzeugfabrik Konstruktionen GmbH, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,916

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304398

Int. Cl.⁴ F01L *1/24*

U.S. Cl. 123—90.46 **4 Claims**



1. An internal element for a hydraulic valve play compensating element for internal combustion engines, the internal element comprising a cylinder element closed at one end and being guided for longitudinal displacement in a guide bore of a casing with a closed end, a piston element being guided for longitudinal displacement in the cylinder element and projecting beyond the open end thereof with its one end having a reduced outer diameter and abutting the closed end of the guide bore and a sheet-metal cap having a substantially axially extending collar and a radial flange, the sheet-metal cap by means of its collar being fitted on the open end of the cylinder element having a reduced outer diameter with an additional diameter reduction in the form of a circumferential groove into which the collar engages positively at some circumferential places at least and by means of its flange engaging the one end of the piston element having a reduced outer diameter, the sheet-metal cap also having at at least one place of its circumference a projection radially protruding beyond the outer diameter of the cylinder element and engaging a zone of enlarged diameter of the guide bore located near the closed end thereof.

4,570,583

ENGINE STARTER PROTECTING DEVICE

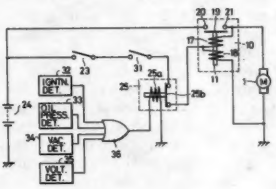
Isao Hamano; Akira Morishita; Yoshifumi Akae; Youji Nishimura; Toshinori Tanaka, and Kiyoshi Yabunaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,928

Claims priority, application Japan, Nov. 30, 1982, 57-182804[U]

Int. Cl.⁴ F02N *11/08*

U.S. Cl. 123—179 K **4 Claims**



1. An engine starter protecting device for an engine starter of a type comprising a starter motor for turning an engine, an electromagnetic switch for controlling said starter motor, a key switch for controlling said electromagnetic switch, and a battery for electrically energizing said starter motor and said electromagnetic switch, comprising:

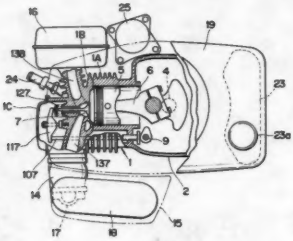
a first switch, operatively associated with said engine, which is closed when said engine is disengaged from wheels and otherwise opened; and a second switch operatively associated with said engine, which is opened when a speed of rotation of said engine is at or above a predetermined value and otherwise closed, said first and second switches being connected in series with one another and coupled between said battery and said electromagnetic switch for controlling actuation of said electromagnetic switch;

wherein said second switch comprises at least two detectors selected from a group consisting of an ignition detector which operates when the frequency of engine ignition pulses is at a predetermined value or higher, an oil pressure detector which operates when an engine lubrication oil pressure is at a predetermined value or higher, a vacuum pressure detector which operates when a pressure of intake air to said engine is at a predetermined value or higher, and a charging detector which operates when an output voltage of an alternator is at a predetermined value or higher; and a protecting switch, coupled to outputs of each of said detectors, which is opened when at least one of said detectors operates.

4,570,584
GENERAL-PURPOSE INTERNAL COMBUSTION ENGINE WITH VERTICAL CRANK SHAFT

Yonekazu Uetsuji, Saitama, and Shoji Watanabe, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,629
Claims priority, application Japan, Oct. 15, 1982, 57-180867
Int. Cl.[4] F02N *17/00*
U.S. Cl. 123—179 SE **6 Claims**

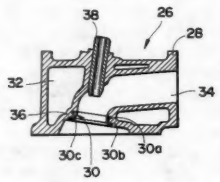


1. A general-purpose internal combustion gasoline engine comprising:
(a) a cylinder block including a cylinder barrel, a cylinder head, and a cylinder cover;
(b) a crank shaft mounted in the cylinder block having an axis of rotation which extends vertically;
(c) intake and exhaust valves disposed in said cylinder head in overhead relationship and along a vertical plane including a longitudinal axis of said cylinder block;
(d) an intake passage defined entirely within a first side of said cylinder head, and openable and closable by said intake valve;
(e) an exhaust passage defined entirely within a second side of said cylinder head which is opposite to said first side, and openable and closable by said exhaust valve;
(f) a carburetor connected to said intake passage and located on the first side of said cylinder head; and
(g) a muffler connected to said exhaust passage and located on the second side of said cylinder head.

4,570,585
LIGHT METAL CYLINDER HEAD WITH VALVE SEAT INSERT

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 5, 1983, Ser. No. 482,306
Claims priority, application Japan, Apr. 21, 1982, 57-66514
Int. Cl.[4] F01L *3/02*
U.S. Cl. 123—188 S **1 Claim**

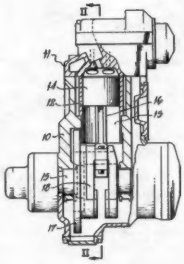


1. A light metal cylinder head comprising:
a block cast in light metal and having intake and exhaust ports; and
an annular valve seat insert embedded in said block by casting said block around said valve seat insert;
wherein said valve seat insert is formed from heat-resisting sheet metal into a tapered ring by pressing and has at the axially opposed ends thereof a pair of outward flanges extending radially from said tapered ring and embedded in said block to provide a firm joint between said valve seat insert and said block and also has a tapered inner circumferential surface smoothly and consecutively joined to one of said ports and containing at the larger diameter end thereof a valve seating surface, said valve seat insert being in contact at all of the exterior surface thereof except for said inner circumferential surface with said block.

4,570,586
INTERNAL COMBUSTION ENGINE

Geoffrey E. Roe, Stockport, England, assignor to The Victoria University of Manchester, Manchester, England

Filed Mar. 16, 1982, Ser. No. 358,714
Claims priority, application United Kingdom, Mar. 24, 1981, 8109178
Int. Cl.[4] F02B *75/06;* **F16F** *15/28, 15/30*
U.S. Cl. 123—192 B **5 Claims**



1. An internal combustion engine of the kind having a crankshaft, at least one piston reciprocating within a cylinder, a flywheel co-axially mounted on the crankshaft, and an oil-retaining crankcase housing the crankshaft, characterized in that the flywheel, in the shape of an annular ring, is housed within the crankcase and is offset axially from the cylinder along said crankshaft and is so configured and positioned that a portion of its periphery stands directly alongside and adjacent a portion of said cylinder, and with a balance weight being attached to the crankshaft adjacent the flywheel, said balance weight being positioned directly below the cylinder.

4,570,587
INTERNAL COMBUSTION ENGINE

Yoshimi Watanabe; Yukio Tada; Takanori Suzuki, and Hitoshi Suzuki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

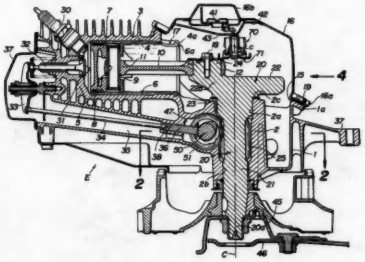
Filed Mar. 28, 1984, Ser. No. 594,162
Claims priority, application Japan, Mar. 29, 1983, 58-54286; Mar. 29, 1983, 58-46077[U]; Mar. 29, 1983, 58-46080[U]
Int. Cl.[4] F01B *31/00*
U.S. Cl. 123—193 P **2 Claims**

1. A method of disassembling and assembling an internal combustion engine which includes
a crank shaft having a crank web, a crank pin on one end of said crank web, and a weight on an opposite end of said crank web;
a crank case supporting said crank shaft therein;
a cylinder;
a piston reciprocally fitted in said cylinder;
a rod coupled to said piston by a piston pin and connecting said piston to said crank pin for reciprocally moving said piston in said cylinder;

said crank case having an opening extending obliquely to axes of said crank shaft and said cylinder;

said cylinder having an end corresponding to a bottom dead center of said piston and having a first recess opening toward said opening, said first recess being of a size allowing said piston pin to pass therethrough when said piston is in said bottom dead center; and

said crank web being disposed on an axial end of said crank shaft, said weight having a second recess on one side thereof exposing adjoining back and side inwardly spaced surfaces of said weight, said second recess being of a shape defining with said end of said cylinder a space allowing



said piston as disconnected from said rod to pass therethrough, the method comprising the steps of:

(a) exposing said opening in said crank case;

(b) positioning said piston in said bottom dead center in said cylinder via movement of said crank shaft to cause said piston pin and a pin hole therefor in said rod to face said first recess;

(c) passing said piston pin through said pin hole;

(d) bringing said second recess into confronting relation to said end of said cylinder to define said space therebetween via movement of said crank shaft such that said weight extends normal to said piston; and

(e) passing said piston through said space.

4,570,588

APPARATUS FOR AUTOMATICALLY CONTROLLING THE INJECTION OF FUEL IN DIESEL ENGINES

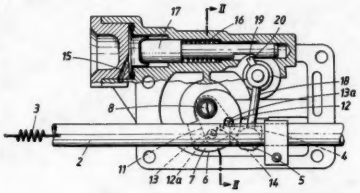
Günther H. Herdin, Steyr, and Walter Hack, Ternberg, both of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed May 11, 1984, Ser. No. 609,192

Claims priority, application Austria, May 20, 1983, 1852/83

Int. Cl.⁴ F02B *77/08*; G05G *11/00*

U.S. Cl. 123—198 DB **16 Claims**



1. In an apparatus for controlling the injection of fuel from at least one fuel injection pump in a diesel engine, comprising

a control rod which is axially adjustable and adapted to control said at least one fuel injection pump in dependence on an axial position of said control rod,

a stepping motor having a rotary output shaft, and

a mechanism comprising a resiliently yieldable coupling and connected to said shaft and to said control rod and adapted to impart an axial movement to said control rod in response to a rotary movement of said shaft,

the improvement wherein said mechanism comprises

a camwheel rotatable about the axis of said shaft and having a cam,

an interposed element disposed between and engaging said control rod and said cam,

a spring biasing said control rod in one axial direction to bear against said cam through the intermediary of said interposed movable element so that said control rod is arranged to move against the force of said spring in response to a rotation of said camwheel in one sense,

a coupling member constituting part of said resiliently yieldable coupling and nonrotatably connected to said shaft,

coupling means constituting part of said resiliently yieldable coupling and permitting a limited angular movement of said coupling member relative to said camwheel in one sense and arranged to rigidly couple said coupling member to said camwheel during an angular movement of said coupling member in the opposite sense, and

spring means opposing an angular movement of said coupling member relative to said camwheel in said one sense,

said coupling member comprising a coupling plate, which is nonrotatably connected to said shaft,

said coupling means comprising a first bore formed in said coupling plate, a second bore formed in said camwheel, a first coupling pin carried by said camwheel and protruding into said first bore with an angular backlash about the axis of said shaft, and a second coupling pin carried by said coupling plate and protruding into said second bore with an angular backlash about the axis of said shaft, said first and second bores and said first and second coupling pins being parallel to the axis of said shaft, and

said spring means comprising a tension spring interconnecting said first and second coupling pins.

4,570,589

METHOD FOR REDUCING DAMAGE ASSOCIATED WITH DETONATION AND/OR DESTRUCTIVE KNOCK

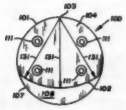
Edward A. Fletcher, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

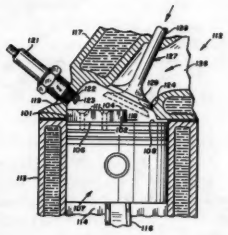
Division of Ser. No. 406,484, Aug. 9, 1982, Pat. No. 4,501,236.

This application Nov. 19, 1984, Ser. No. 672,466

Int. Cl.⁴ F02F *3/14*

U.S. Cl. 123—193 P **21 Claims**





1. A method of attenuating detonation in an internal combustion engine having inside cylindrical wall means, a combustion chamber, and piston means reciprocally located within said cylindrical wall means, said piston means having an air/fuel mixture intake, compression, power, and exhaust movements

comprising: providing an air/fuel mixture in the combustion chamber during intake movement of the piston means, compressing said air/fuel mixture in the combustion chamber during compression movement of the piston means, igniting said compressed air and fuel mixture with a spark in the combustion chamber at an ignition point located contiguous to one portion of the inside cylindrical wall means at completion of the compression movement of the piston means whereby the air/fuel mixture burns establishing a flame front that propagates from the ignition point across the combustion chamber, abruptly increasing cross sectional area of the combustion chamber in a direction of travel of the flame front after the entire flame front passes over a maximum width of the combustion chamber that is normal to a diameter line passing through said ignition point, and expanding the burning air/fuel mixture in the combustion chamber during power movement of the piston means, and exhausting the burned air/fuel mixture from the combustion chamber during the exhaust movement of the piston means.

4,570,590

INTERNAL COMBUSTION ENGINE WITH MULTIPLE INTAKE VALVES

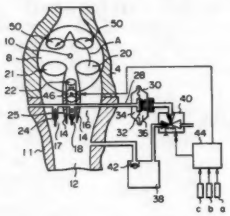
Taiyo Kawai; Norihisa Nakagawa, both of Susono; Nobuaki Kayanuma, Gotenba, and Toshinari Nagai, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 4, 1985, Ser. No. 707,872

Claims priority, application Japan, Jul. 10, 1984, 59-103124[U]

Int. Cl.⁴ F02B *31/02, 25/00*

U.S. Cl. 123—308 **5 Claims**



1. An internal combustion engine having a cylinder block and a cylinder head secured thereonto to define cylinders therein, each of said cylinders having a piston inserted therein with a combustion chamber defined above said piston, said engine, comprising:

first, second, and third intake passage means communicated with the combustion chamber of each cylinder, said first intake passage means being helically shaped so that a swirl can be generated in the combustion chamber;

first, second, and third intake valves provided for said first, second, and third intake passage means, respectively, said intake valves being operably connected to said piston;

a first intake control valve located in said second intake passage means upstream of said second intake valve and a second intake control valve located in said third intake passage means upstream of said third intake valve;

actuating means for said intake control valves responsive to operating conditions of the engine; and

a fuel injector located in said third intake passage means between said third intake valve and said second intake control valve.

4,570,591

SYSTEM FOR CONTROLLING THROTTLING OF INTAKE AIR AND PRESSURE OF FUEL INJECTION IN DIESEL ENGINE

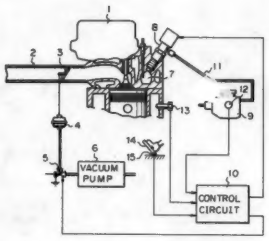
Atsushi Hashikawa, Okazaki; Tetsuro Kikuchi, Nishio; Kazutaka Katoh, Okazaki; Satosi Kuwakado, Nukata, and Noriaki Kawai, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 7, 1985, Ser. No. 689,373

Claims priority, application Japan, Jan. 13, 1984, 59-3549

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—331 **9 Claims**



1. A system for controlling throttling of intake air in an intake air passage and pressure of fuel injection in a swirl chamber of a diesel engine, comprising:

an intake air throttling mechanism provided in said intake air passage;

a fuel injection apparatus provided in said swirl chamber, the valve opening pressure of said fuel injection apparatus being variable; and

means for controlling said intake air throttling mechanism and said fuel injection apparatus, said control means reducing the valve opening pressure of said fuel injection apparatus when closing said intake air throttling in accordance with predetermined operating parameters of said engine.

4,570,592

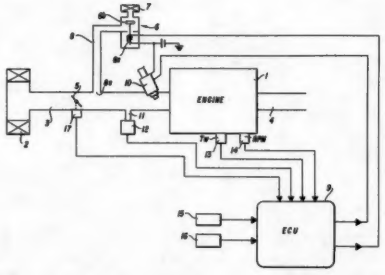
METHOD OF FEEDBACK-CONTROLLING IDLING SPEED OF INTERNAL COMBUSTION ENGINE

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,088

Int. Cl.⁴ F02M *3/07*

U.S. Cl. 123—339 **4 Claims**



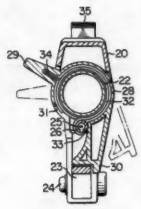
1. A method of feedback controlling idling speed in an internal combustion engine having an intake air amount control means for controlling the amount of air intake wherein, during an idling operation said intake air amount control means is

feedback controlled as a function of the deviation of actual engine speed from a target engine speed, and wherein when the engine speed becomes lower than a predetermined speed while said engine is decelerating, said intake air amount control means is set to an initial value prior to or at the start of the feedback control, said method including the steps of detecting the engine speed; detecting the rate of deceleration of the engine when the detected engine speed becomes lower than the predetermined speed while the engine is decelerating; and setting the initial value of said intake air amount control means as a function of the rate of deceleration.

4,570,593
THROTTLE SAFETY DEVICE

Tokio Take, Musashino; Satoshi Sonoda, and Takayuki Yamamoto, both of Tokyo, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,435
Claims priority, application Japan, Dec. 2, 1983, 58-185780
Int. Cl.⁴ G05G *5/04*
U.S. Cl. 123—398 **1 Claim**



1. A throttle safety device comprising:
a main body secured to an operating rod;
a throttle trigger pivotably connected to said main body;
a locking member pivotably mounted to an outer periphery of said operating rod and movable between an operative position in which it is brought into locking engagement with the throttle trigger and an inoperative position in which it is brought out of locking engagement with the throttle trigger; and
a coil spring mounted on the outer periphery of the operating rod and having one end secured to a fixed part of the device and an opposite end connected to the locking member to resiliently force the locking member to move to the operative position, said coil spring being turned into wrapping and pressing engagement with the outer periphery of the operating rod when the locking member is in the inoperative position so as to hold the latter in the inoperative position.

4,570,594
METHOD FOR CONTROLLING INTERNAL COMBUSTION ENGINE

Tsuneyuki Egami, Aichi; Hisasi Kawai, Toyohashi, and Tsutomu Saito, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

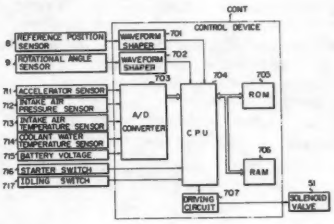
Filed Nov. 29, 1984, Ser. No. 676,286
Claims priority, application Japan, Dec. 1, 1983, 58-225406
Int. Cl.⁴ F02P *5/00*
U.S. Cl. 123—414 **3 Claims**

1. A method for controlling an internal combustion engine including a process for obtaining a retard angle (θ) from the timing of an output of a reference angular position sensor to a desired rotational position by using a signal of a reference angular position sensor for producing a reference signal at a known rotational position of the engine, a signal of a rotational angle sensor for producing angular signals with intervals of a predetermined crank angle (θ_o) of the engine, and timing signals produced with intervals of a predetermined time-length, for generating an engine control signal at a desired rotational position of the engine;

said method comprising the steps of:

obtaining the retard angle (θ) by the signal of said rotational angle sensor, with unit intervals of the angle (θ_o), from the reference angular position to an angular position which is nearest to but does not exceed said retard angle (θ), the angular difference between said nearest angular position and said retard angle (θ) not exceeding said predetermined crank angle (θ_o);

carrying out the time-conversion of an angle deviation (θ_z) as the remainder based on current average engine rotational speed;



counting the time obtained by said time-conversion by said timing signals produced with intervals of a predetermined time-length; and

producing engine control signal based on the count value of said counting;

wherein at least two data of instantaneous engine rotational speed obtained per angular signal of said rotational angular sensor are stored in a memory device;

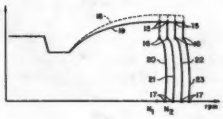
estimating instantaneous engine rotational speed at the timing at which the engine control signal is produced based on said data stored in the memory device; and

the correction time-conversion of said angle deviation (θ_z) is carried out based on said estimated instantaneous engine rotational speed.

4,570,595
IGNITION DEVICE OF AN I.C. ENGINE

Bo C. Andreasson, Gothenburg, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Apr. 5, 1984, Ser. No. 596,944
Claims priority, application Sweden, Apr. 15, 1983, 8302114
Int. Cl.⁴ F02P *5/15*
U.S. Cl. 123—418 **4 Claims**



1. A method for controlling spark timing of an internal combustion engine, comprising producing a number of pulses corresponding to engine r.p.m., storing the number of said

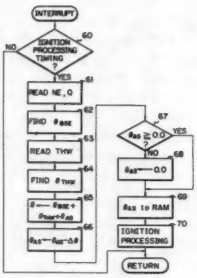
pulses, and controlling the timing of ignition of the engine in response to said stored number, said step of controlling comprising producing momentary retardation of ignition through an angle of from 1°–10° on the crankshaft at an r.p.m. N_1, and then producing still greater ignition angle retardation following a sloping characteristic to an r.p.m. N_2 higher than N_1.

3. In an ignition device for an I.C. engine, the device having a magnetic system generating ignition energy and an ignition coil, a spark plug connected to a secondary winding thereof and a primary winding connected to a triggerable ignition switch, a detector indicating a reference time for every spark and a microcomputer having a static memory, a timer and a comparator in which timer pulses and reference numbers from the timer and the memory, respectively, are compared and via output circuits supply a trigger pulse to the ignition switch, the improvement wherein said memory stores positions for reference numbers which at a determined r.p.m. N_1 firstly produce a momentary retardation of ignition through an angle of from 1°–10° on the crankshaft and then after this retardation produce a still further retardation in the ignition angle with a characteristic sloping to a higher r.p.m. N_2 at which r.p.m. the spark is stopped.

4,570,596
IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Kunihiko Sato, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 28, 1984, Ser. No. 687,262
Claims priority, application Japan, Mar. 26, 1984, 59-56155
Int. Cl.⁴ F02P 5/15
U.S. Cl. 123—421 **8 Claims**



1. An ignition timing control apparatus for an internal combustion engine comprising:

means for detecting the operating state of the engine;

means for finding a basic ignition timing in accordance with the detected operating state;

means for detecting the temperature of the coolant of the engine;

means for finding a first advance angle correction coefficient corresponding to the detected coolant temperature;

means for detecting the timing when the startup of the engine is completed;

means for finding a second advance angle correction coefficient corresponding to said detected coolant temperature directly after the completion of startup;

means for gradually attenuating said second advance angle correction coefficient to zero;

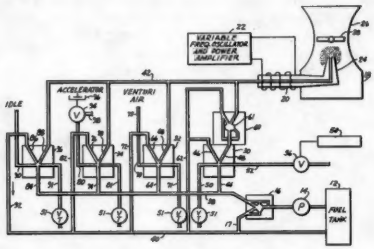
means for correcting said basic ignition timing in accordance with said first and second advance angle correction coefficients; and

means for adjusting the actual ignition timing of the engine in accordance with said corrected ignition timing.

4,570,597
FLUIDIALLY CONTROLLED FUEL SYSTEM

Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev. 89107

Filed Jul. 6, 1984, Ser. No. 628,492
Int. Cl.⁴ F02D 3/02
U.S. Cl. 123—444 **8 Claims**



1. A fuel supply system for an internal combustion engine comprising;

a fuel tank;

a carburetor;

a plurality of fluidic control means having inlets and a plurality of outlets, said plurality of outlets supplying fuel from said tank to said carburetor in said engine; said fluidic control means including at least a separate fluidic control for starting, idling, accelerating, and cruising conditions respectively;

pump means pumping fuel from said fuel tank to said fluidic control means; said pump means including constant pressure fluidic control means;

ultrasonic spray means in said carburetor connected to receive fuel from said plurality of fluidic control means and discharge the fuel into said engine;

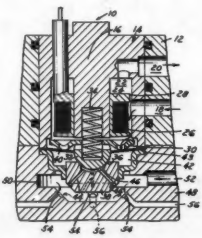
responsive means responsive to an engine condition connected to a control line in each of said plurality of fluidic control means;

whereby each of said fluidic control means responds to an engine condition being monitored by said responsive means to increase or decrease fuel supply at constant pressure to said ultrasonic spray means.

4,570,598
AIR ASSIST FUEL DISTRIBUTOR TYPE FUEL INJECTION SYSTEM

Rogelio G. Samson, Bloomfield Hills; Paul L. Koller, Wyandotte, and Laszlo Hideg, deceased, late of Dearborn Heights, all of Mich. (by Gizella Hideg, executrix), assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 15, 1985, Ser. No. 723,604
Int. Cl.⁴ F02M 61/16
U.S. Cl. 123—445 **4 Claims**



1. A fuel supply system for an internal combustion engine comprising a single fuel injector supplying fuel to a plurality of

cylinders of the engine, each cylinder having an intake port at one end of an individual fuel line connected thereto for the flow of fuel thereinto, the opposite end of each fuel line being operatively connected to the fuel injector, the injector having a tip having a number of fuel discharge passages corresponding in number to the number of fuel lines and an atmospheric air chamber contiguous to the passages, means connecting each fuel line to a fuel passage across the air chamber with an air space therebetween for atomization of the fuel discharged between the two in response to vacuum in the engine intake ports establishing an air flow through the air chamber and fuel lines carrying the atomized fuel therewith for an equal distribution to each cylinder.

4,570,599

AIR-FUEL RATIO FEEDBACK CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, CAPABLE OF ACHIEVING PROPER AIR-FUEL RATIOS FROM THE START OF THE ENGINE

Shumpei Hasegawa, Niiza, and Noriyuki Kishi, Itabashi, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

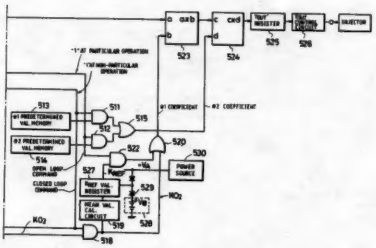
Continuation of Ser. No. 476,323, Mar. 17, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,755

Claims priority, application Japan, Mar. 19, 1982, 57-44087

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—489 **3 Claims**



1. An air-fuel ratio feedback control system for controlling the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust system, comprising:

a sensor arranged in said exhaust system for detecting the concentration of exhaust gases emitted from said engine;

means for detecting a plurality of particular operating conditions of said engine;

means for detecting at least one engine operating parameter value;

means for calculating a basic value of the air-fuel ratio on the basis of at least one detected engine operating parameter value;

electric circuit means responsive to the output of said exhaust gas concentration sensor to generate (i) a first coefficient variable in response to the output of said exhaust gas concentration sensor and (ii) at least one second coefficient variable in response to the output of said particular operating condition detecting means,

said first and second coefficients being applied for correction of said basic value,

said electric circuit means including means operable when the engine is operating in an operating condition other than said particular operating conditions, to (i) vary the value of said first coefficient in response to the output of said exhaust gas concentration sensor and (ii) simultaneously hold the value of said second coefficient at a first predetermined value which does not substantially change said basic value of the air-fuel ratio;

means for calculating as a second predetermined value a mean value of values of said first coefficient obtained when the engine is operating in said operating condition other than said particular operating conditions;

means operable when the engine is operating in one of said particular operating conditions, to (i) hold the value of said second coefficient at a third predetermined value different from said first predetermined value but appropriate to said one of said particular operating conditions and (ii) simultaneously hold the value of said first coefficient at said second predetermined value, whereby the air-fuel ratio is close to a desired air-fuel ratio suitable for operation of the engine in each of said particular operating conditions; and

storage means for storing and holding said second predetermined value both during operation of the engine and during stoppage of the engine.

4,570,600

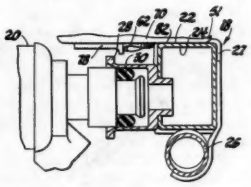
FUEL RAIL ASSEMBLY AND METHOD OF FABRICATION

Terrance J. Atkins, Rochester; Martin J. Field, Churchville, and Daniel Nolan, Spencerport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1982, Ser. No. 427,763

Int. Cl.[4] F02M *39/00*; F02B *3/00*

U.S. Cl. 123—468 **2 Claims**

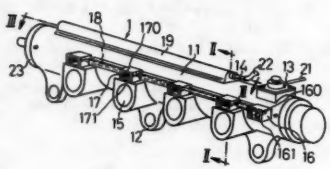


1. A fabricated fuel rail assembly for an engine, said assembly comprising an elongated sheet metal fuel rail body defining a fuel supply passage and having a plurality of axially spaced transversely extending fuel injector sockets, said passage intersecting said sockets for supplying fuel to said sockets, each of said sockets receiving a fuel injector adapted to deliver fuel from its socket to the engine, and a fuel pressure regulator for controlling the fuel pressure in said fuel supply passage, said pressure regulator including a diaphragm overlying a sheet metal base and defining a fuel chamber therebetween, said base including a fuel access region opening from said supply passage to said chamber and a fuel outlet opening from said chamber and a valve seat surrounding said outlet, said diaphragm carrying a valve member controlling fuel flow past said valve seat through said outlet, a coil spring engaging said diaphragm and biasing said diaphragm to urge said valve member toward said valve seat whereby fuel flow past said valve seat through said outlet is controlled to balance the fuel pressure on said diaphragm with the bias of said spring on said diaphragm, and wherein said fuel rail body is formed with a planar region and an aperture in said planar region, said pressure regulator base is formed with a planar region which overlies said fuel rail body planar region, said fuel access region is formed as a tubular fitting extruded from said base and extending directly into said aperture to provide a fuel flow connection from said fuel supply passage to said pressure regulator chamber, and said planar region of said pressure regulator base is brazed to said planar region of said fuel rail body to maintain said pressure regulator in a securely sealed assembly with said fuel rail body.

4,570,601
FUEL DELIVERY PIPE

Masaki Ito, Handa, and Hiroshi Yamazoe, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 8, 1984, Ser. No. 669,514
Claims priority, application Japan, Nov. 15, 1983, 58-214850
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—468 6 Claims



1. A fuel delivery pipe for delivering fuel into injectors of an internal combustion engine comprising:

a cylindrical main body provided with two closed ends and made of heat and electricity insulating plastic material, a fuel inlet pipe and a fuel return pipe being connected to said cylindrical main body;

a fuel regulator provided in said cylindrical main body for regulating the fuel pressure within said cylindrical main body;

a plurality of fuel outlet ports provided in a cylindrical wall of said cylindrical main body at predetermined intervals; said plurality of fuel outlet ports being to be connected to said injectors;

an input connector provided in said cylindrical main body and connected to a fuel injection control computer by means of a cable;

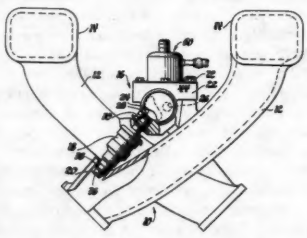
power supply connectors provided in said cylindrical main body and near said plurality of fuel outlet ports to be electrically connected to power reception connectors provided in said injectors; and

lead wires embedded within said main body for electrically connecting said input connector and said power supply connectors.

4,570,602
FUEL RAIL

Terrance J. Atkins, Rochester; Martin J. Field, Churchville, and Donald J. Lamirande, Spencerport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1982, Ser. No. 410,641
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—468 2 Claims

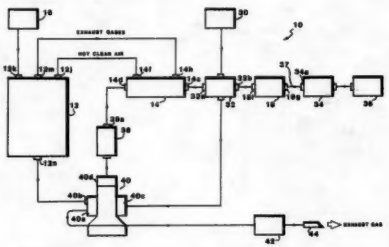


1. A compact fuel rail for a V-engine having a plurality of fuel injector openings arranged in two lines, said fuel rail comprising an elongated body mountable above and between said lines and having a plurality of axially spaced fuel injector sockets and a pair of axially extending fuel passages, said fuel passages being interconnected and one of said passages intersecting said sockets for supplying fuel to said sockets, at least one end of said body having a circular recess intersected by and encompassing the associated ends of said fuel passages, one of said passages being circular in cross section, a circular plug received in said circular cross section passage adjacent said recess for limiting interconnection of said passages through said recess, a circular plug received in and sealing said recess to provide a closure for the associated ends of said passages, some of said sockets extending transversely leftwardly and downwardly toward one of said lines and the remainder of said sockets extending transversely rightwardly and downwardly toward the other of said lines, each of said sockets receiving a fuel injector suitable for delivering fuel from its socket through one of said openings, each of said injectors having a clip for securing said injector to said fuel rail, each of said injectors further having a tip adapted to be received in one of said openings, and means for securing said fuel rail to said engine above and between said lines by exerting only a downward force on said body to thereby retain said injectors between said fuel rail and the engine.

4,570,603
APPARATUS FOR IMPROVING GASOLINE CONSUMPTION, POWER AND REDUCING EMISSION POLLUTANTS OF INTERNAL COMBUSTION ENGINES

Roberto Piedrafita, 1818 S. Birch St., Santa Ana, Calif. 92707

Filed Sep. 1, 1983, Ser. No. 528,410
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—570 9 Claims



1. An apparatus for improving performance and reducing fuel consumption and emission pollutants from an internal combustion gasoline engine comprising:

(a) an internal combustion gasoline engine having, in part, an intake manifold and an exhaust manifold where the exhaust manifold is modified to include a manifold exhaust port,

(b) a modified internal combustion engine carburetor connected to the intake manifold on said engine and

(1) removal of the power valve and capping the power valve cavity, and

(2) reducing the diameter of the main gasoline jets,

(c) a positive crankcase ventilation valve (PCV) having an input port conventionally connected to said internal combustion engine and also having a PCV output port,

(d) an automobile fuel pump having an input connected to a conventional fuel tank and having a fuel pump output port,

(e) a thermic reactor comprising a hermetic enclosure housing a contiguous hollow tube shaped to provide a laminar flow of gas, with the tube having a clean air input port on one terminating end and having a hot clean air exhaust port on the other terminating end with said thermic reactor also having an engine exhaust input port, and an engine exhaust output port, and where the engine exhaust input port is pneumatically connected to the manifold exhaust port on the exhaust manifold of said engine,

(f) a thermic reactor air cleaner pneumatically connected to the clean air input port on said thermic reactor,

(g) a catalytic gas injector comprised of a rectangular solid block having along the length and extending through the block a horizontal bore centrally located on the upper half of the block as viewed from the end of the block where one end of the horizontal bore serves as a catalytic gas output port that is pneumatically connected to the catalytic gas input port on saic carburetor and where the other end is a PCV input port that is connected to the PCV output port of said PCV valve, with the block also having a first vertical bore and a second vertical bore where both vertical bores are of identical diameter as that of the horizontal bore and commence from the edge of the block furthest from the horizontal bore where both bores are coterminus with the horizontal bore and where the first vertical bore serves as a hot clean air input port that is connected to the hot clean air exhaust port on said thermic reactor and where the second vertical bore serves as an engine exhaust input port that is connected to the engine exhaust output port on said thermic reactor, and

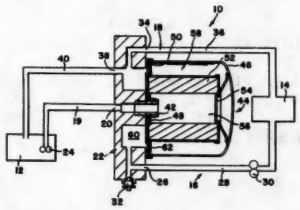
(h) a fuel regulator/restrictor comprised of a solid block having a fuel pump input port and a carburetor output port, where the two ports are internally and pneumatically connected by means of a novel plurality arrangement of vertical bores, capped cavities and flow restrictor tubes, where the fuel pump input port is pneumatically connected to the fuel pump output port and where the carburetor output port is pneumatically connected to the conventional gasoline input port on said carburetor.

4,570,604

FUEL SYSTEM FOR A VEHICLE ENGINE

Donald I. Thornton, Warwick, R.I., and Richard H. Peyton, Berkley, Mass., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 20, 1983, Ser. No. 563,473
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—514 **10 Claims**



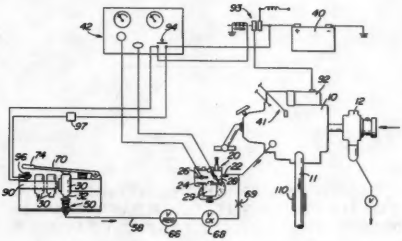
1. Fuel supply system for a vehicle engine comprising fuel storage means, a fuel supply line communicating said fuel storage means to said engine, a fuel return line for returning unused fuel to said fuel storage means, a fuel reservoir housing communicated with said fuel supply and fuel return lines and dividing said fuel supply line into a first section communicated with said fuel storage means and a second section communicated with said engine, said housing being divided into an inlet chamber communicated with said first section of said fuel supply line and an outlet chamber communicated with the second section of said fuel supply line and with said fuel return line, first pump means for pumping fuel through said first section of said fuel supply line, and second pump means for pumping fuel through the second section of said fuel supply line at a flow rate less than the flow rate at which the first pump means pumps fuel through the first section of the fuel supply line, the quantity of fuel pumped into said reservoir housing through said first section of the fuel supply line in excess of the quantity of fuel pumped from said reservoir housing through the second section of the fuel supply line being returned to said fuel storage means through said fuel return line, said fuel return line being divided into a first section between the engine and the reservoir housing and a second section between the reservoir housing and said fuel storage means, said outlet chamber providing a substantially unrestricted flowpath between said first and second sections of the fuel return line and the second section of the fuel supply line so that the quantity of fuel pumped by said first pump means in excess of the quantity of fuel pumped by said second pump means is normally pumped into said fuel return line at a pressure level greater than the pressure level in the fuel return line to prevent flow of fuel from said first section of the fuel return line into the second section of the fuel supply line during normal operation of said first pump means, but communication being permitted between said first section of the fuel return line into the second section of the fuel supply line through said outlet chamber when said first pump means fails to pump fuel into said first section at a predetermined rate.

4,570,605

FUEL SUPPLY FOR A PISTON ENGINE

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Mar. 15, 1982, Ser. No. 358,547
Int. Cl.⁴ F02M *1/16, 25/00*
U.S. Cl. 123—576 **15 Claims**



1. A fuel supply for an internal combustion engine having a fuel inlet means for delivering a fuel-air mixture to the engine combustion chamber comprising:

means for supplying a running fuel to the fuel inlet means for use in the normal operation of the engine,

said running fuel having a relatively low volatility,

and means for supplying a starting fuel to the fuel inlet means for use in starting the engine,

said starting fuel having a relatively high volatility,

said starting fuel supply means comprising a sealed pressurized cartridge containing a limited supply of said starting fuel,

said cartridge having a discharge passage closed by a valveless permanent seal of penetrable material extending across the discharge passage and including means cooperable with said penetrable material closing said discharge passage for penetrating the same to release all of the limited supply of said pressurized starting fuel contained in said cartridge.

4,570,606

SHOCK REDUCED BOW

Paul L. Peck, Fond du Lac, Wis., assignor to Tru Fire Corporation, North Fond du Lac, Wis.

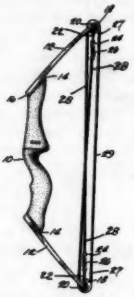
Filed Dec. 8, 1983, Ser. No. 559,339
Int. Cl.⁴ F41B *5/00*
U.S. Cl. 124—24 R **5 Claims**

1. An archery bow having bow limbs and including,

a bow string system including a bow string, and

spring means in said system allowing said bow limbs to ovetravel the at-rest position after an arrow has been cast,

said spring means having a spring rate requiring more force to deflect said spring means than the tension in the bow string at full draw of the bow with the result that the



spring means does not deflect appreciably when the bow is drawn but does deflect a substantial amount as the limbs pass their at-rest position following the release of said bow string system at full draw.

4,570,607

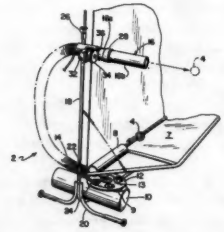
TENNIS BALL THROWING MACHINE WITH CONTINUOUSLY ROTATABLE BARREL HAVING FRICTION STRIP ON ONE SIDE ONLY OF INNER WALL

Gilbert A. Stokes, Star Rte., Mountain Ranch, Calif. 95246

Filed Aug. 18, 1983, Ser. No. 524,434

Int. Cl.[4] F41F *1/04*

U.S. Cl. 124—56 **6 Claims**



1. A tennis ball throwing machine comprising a barrel, support means for supporting the barrel for rotation about its lengthwise axis,

means for successively feeding tennis balls to the barrel,

means for successively propelling said balls through the barrel,

friction strip means on one side only of the inner wall of the barrel for imparting spin to a ball propelled therepast,

and motor means connected to the barrel for continuously rotating the barrel through 360 degrees about the longitudinal axis of the barrel so as to continuously rotate the friction strip means around said longitudinal axis whereby to continuously vary the sense of the spin from top spin to back spin and side spin to side spin.

4,570,608

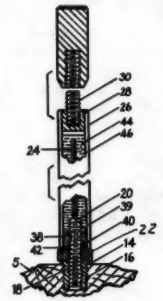
ARCHERY BOW STABILIZER AND VIBRATION DAMPENER

Ernest W. Masterfield, 7420 Wade Cir., Anchorage, Ak. 99502

Filed Mar. 29, 1983, Ser. No. 480,006

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—89 **6 Claims**



1. In an inertial stabilizer for a conventional archery bow, said stabilizer comprising:

a hollow member,

a viscous fluid disposed in said member,

energy dissipating means including a stud for rigid connection to a conventional bow,

said hollow member being fixedly and rigidly connected to the stud,

a rod connected to the stud and disposed within the hollow member in direct contact with the viscous fluid,

said stabilizer being arranged to extend outwardly and generally forwardly of said conventional bow when mounted thereon.

4,570,609

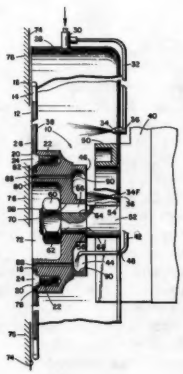
WATER-COOLED HUB FOR FLUSH-CUT CONCRETE SAWS

John J. Hogue, 11586 Monroe Way, Thornton, Colo. 80233

Filed Oct. 5, 1984, Ser. No. 658,362

Int. Cl.[4] B28D *1/04*

U.S. Cl. 125—13 R **10 Claims**



1. For use in combination with a thin planar high speed diamond-edged circular concrete saw blade, the hub for both mounting same and for distributing coolant to the remote face

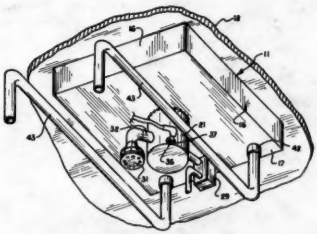
thereof which comprises: a shallow generally cup-shaped member having a forwardly-facing blade-receiving surface bordering a central depression therein, said blade-receiving surface being sized and adapted to border a central opening in the saw blade and receive fasteners entering from the remote face thereof attaching the near face of said blade thereto for rotation in flush face-to-face essentially contacting relation to a planar surface located in opposed relation to said remote face, said member also having a rearwardly-facing surface with an axial bore therethrough for receiving a drive shaft opening into the depression and an annular groove bordering said axial opening, said annular groove being shaped on the outside periphery thereof to define an annular pocket adapted to receive fluid delivered thereto and retain same under the influence of centrifugal forces acting thereagainst when said member is rotated at high speed, said depression being of a depth adapted to house the end of the drive shaft emerging therein and house same along with the means connecting said shaft and member together in recessed relation to the forwardly-facing blade-receiving surface, and a plurality of passages connecting the fluid-retaining pocket in the periphery of the groove to an exposed medial portion of said member positioned between the forwardly-facing blade-receiving surface thereof and the central depression therein that borders the central opening in the blade and does not project beyond its remote face, said passages being so sized and arranged as to conduct fluid from the annular pocket under the influence of the aforesaid centrifugal forces and distribute same onto said remote blade face adjacent its central opening.

4,570,610

PULSE COMBUSTION BURNER FOR COOKING SURFACE

Robert L. Himmel, Cleveland, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Dec. 28, 1984, Ser. No. 687,519
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—39 E **6 Claims**



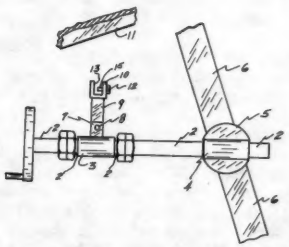
1. A cooking appliance having a flat cooking surface and a pulse combustion burner for heating the cooking surface, the burner comprising a closed shallow combustion chamber formed by intersecting walls, a top of the combustion chamber being in heat transfer relation to the cooking surface, an inlet aperture in a wall of the combustion chamber, gas valve means for supplying a flow of combustible gas to the combustion chamber through the inlet aperture means and restricting reverse flow, means for igniting the combustible gas delivered to the combustion chamber by the gas valve means, outlet aperture means in a wall of the combustion chamber, tailpipe means connected to the outlet aperture means for receiving combusted gases from the combustion chamber, and baffle means in said combustion chamber to shield an area of the combustion chamber associated with the cooking surface adjacent said inlet means from excessive heat transfer from a primary combustion zone immediately upstream of said inlet aperture means.

4,570,611

POSITIVE DAMPER ADJUSTMENT DEVICE AND METHODS OF MAKING AND USING THE SAME

Albert Schroeder, 23 Rollings Hills, St. Louis County, Mo. 63033

Filed Mar. 16, 1984, Ser. No. 590,359
Int. Cl.[4] F23L *3/00*
U.S. Cl. 126—288 **1 Claim**



1. A positive damper adjustment device for use with a fireplace flue provided with an arcuately travelling damper handle comprising,

a housing member,

an elongated threaded member rotatably mounted in said housing member,

clamp means rotatably mounted on proximate one end of said elongated member,

a pair of split nuts mounted on said elongated member and disposed proximate each end of said housing member,

handle means rotatably mounted proximate the other end of said elongated threaded member,

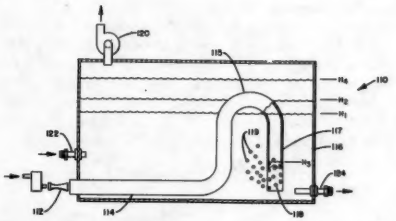
bracket means pivotally mounted to said housing member, such pivotal mounting allowing pivotal motion about an axis transverse to the axis of said elongated member thereby allowing motion toward and away from such damper handle.

4,570,612

INDUCED DRAFT SUBMERGED BURNER

Chester D. Ripka, East Syracuse; James N. Friedman, Manlius, and Thomas E. Drago, Liverpool, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,548
Int. Cl.[4] F24H *1/20*
U.S. Cl. 126—360 A **13 Claims**



1. A heat exchange apparatus for raising the temperature of a liquid contained in a tank comprising:

a horizontal fuel burner located externally to the tank for igniting a fuel and providing combustion gases to the tank;

a combustion chamber generally disposed within the tank for directing said combustion gases therethrough, said combustion chamber including a generally horizontal combustion portion having an inlet in communication with said burner, a generally vertical combustion exhaust

portion for discharging the combustion gases into the liquid in the tank, said horizontal combustion portion and said vertical combustion exhaust portion submerged in the liquid, and a generally inverted U-shaped portion connecting said horizontal portion to said combustion exhaust portion, the curved part of said inverted U-shaped portion being above the liquid in the tank during non-operation of the heat exchange apparatus;

a cold liquuid inlet connected to the tank for injecting the liquid in heat exchange relationship with said combustion gases;

a hot liquid outlet for passing the liquid out from the tank, said hot liquid outlet located in close proximity to said combustion exhaust portion of said combustion chamber; and

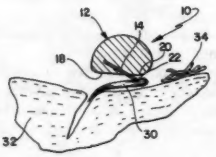
a vaccum pump disposed near the top of the tank to provide a negative pressure in the tank and through which the combustion gases, after exchanging heat directly with the injected cold liquid, pass on their way to be discharged from the tank, said cold liquid inlet located in close proximity to said vacuum pump whereby said combustion gases are in counterflow relationship with said liquid.

4,570,613

METHOD FOR THE REMOVAL OF SPLINTERS

Daniel L. Alkon, 228 Elm Rd., Falmouth, Mass. 02540

Filed Aug. 15, 1983, Ser. No. 523,712
Int. Cl.[4] A61B *17/50*
U.S. Cl. 128—1 R **1 Claim**



1. A method of removing a splinter or the like from a human body, wherein said splinter has penetrated into the skin of said body so that it is totally unexposed comprising:

a. shaving the skin of said body in the area thereof adjacent said splinter with a razor-like instrument to remove portions of said skin in said area adjacent said splinter and to thereby partially expose said splinter, said shaving being effected by applying substantially undirectional strokes with said blade in a direction which is substantially opposite the direction of insertion of said splinter;

b. cutting into said partially exposed splinter with said blade to effect a grasping thereof with said blade without severing said splinter, said cutting step being effected by moving said blade in substantially the same direction as in said shaving step; and

c. withdrawing said splinter with said blade by further moving said blade in substantially the same direction as in said shaving step.

4,570,614

LARYNGOSCOPE WITH DISPOSABLE BLADE AND LIGHT CONDUCTOR

Jack Bauman, 1677 San Onofre Dr., Pacific Palisades, Calif. 90272

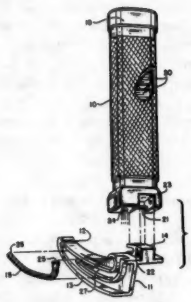
Continuation of Ser. No. 492,190, May 6, 1983, abandoned. This application Jan. 4, 1985, Ser. No. 687,504
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—11 **6 Claims**

1. A non-metallic laryngoscope blade formed from a plastic material into a unitary structure and adapted to be detachably connected to a handle in an L-shaped configuration, said blade comprising:

a. a rigid, lower tongue engaging flange section extending along the length thereof;

b. an upper teeth engaging flange section; and

c. a web having a relatively thin upstanding wall interconnecting the upper and lower flanges which extend laterally from the web and which are integral therewith, said wall having one or more areas of weakness which provide the web with sufficient flexibility so that when the upper teeth engaging flange is urged into contact with a patient's teeth during examination of a patient's larynx, the web will flex or bend, thereby relieving the pressure applied to the patient's teeth by the upper flange and thereby avoiding damaging the patient's teeth.

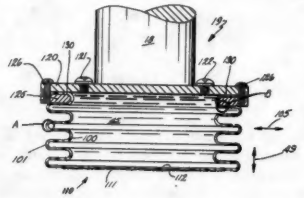


4,570,615

CARDIOPULMONARY RESUSCITATOR MASSAGER PAD

Clare E. Barkalow, Comstock Park, Mich., assignor to Michigan Instruments, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 126,878, Mar. 3, 1980, Pat. No. 4,361,140. This application Sep. 30, 1982, Ser. No. 429,808
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.[4] A61H *31/00*
U.S. Cl. 128—28 **16 Claims**



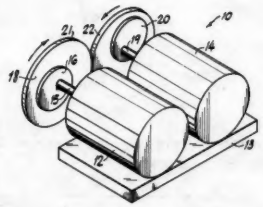
1. A cardiopulmonary resuscitator massager pad comprising a compressible enclosure filled with a substantially incompressible fluid, said enclosure being adapted for mounting on a reciprocating compressor piston of a cardiopulmonary resuscitator for compression between the piston and a patient's chest, said enclosure comprising a nonisoelastic structure that is deformable in directions parallel to the path of travel of said reciprocating compressor piston and that is rigid in directions transverse to the path of travel of said piston, whereby the compressive force of said piston is evenly distributed over a large area on the patient's chest while providing direct correspondence between the displacement of said piston and the deflection of the patient's chest.

4,570,616

VIBRATOR MASSAGER USING BEAT FREQUENCY

Raymond W. Kunz, Monroe, Conn., and Gerald K. Pitcher, Boston, Mass., assignors to Clairol Incorporated, New York, N.Y.

Filed Feb. 19, 1985, Ser. No. 702,528
Int. Cl.[4] F16H 33/18; A61H 1/00
U.S. Cl. 128—36 4 Claims



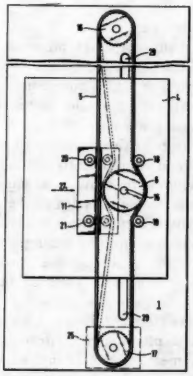
1. A vibration producing device for providing an impulse at a beat frequency comprising:
(a) a common support structure;
(b) two electrically driven motors, the housing of each motor connected to said common support structure;
(c) a cylindrical disc axially attached to the shaft of each motor for rotation therewith, the rims of said discs in operative engagement with each other, said discs having effective diameters differing from each other by a predetermined amount;
(d) an eccentric weight attached to the shaft of each motor.

4,570,617

MASSAGING DEVICE

Heinz G. Baus, 35, Wartobodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Feb. 1, 1984, Ser. No. 575,912
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1983, 3303925
Int. Cl.[4] A61H 7/00
U.S. Cl. 128—52 16 Claims



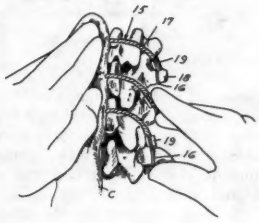
1. A massaging device comprising: a stationary guide; belt means including an endless belt defining opposing belt strands spaced from one another and a stationary motor driving said endless belt; a slide mounted for back and forth movement along said stationary guide; a shaft rotatably mounted on said slide; a drive-wheel fixed to said shaft and in operative engagement with said belt to be rotated by said belt; a drive carrier connected to said slide through said shaft; a reversing drive on said drive-carrier operatively connected to said shaft; said drive carrier being movable with respect to said slide to allow said reversing drive to be operatively connected with said stationary guide and to be disconnected therefrom; said slide with said shaft, drive-wheel and drive-carrier being displaced back and forth along said stationary guide and said drive-wheel engaging only one of the strands of said belt when said reversing drive is operatively connected with said stationary guide; a massaging brush mounted at one end of said shaft to be rotated thereby, and a sliding switch on said slide movable to force the other of said strands of said endless belt against said drive-wheel to stop back and forth movement of said slide and drive-carrier upon disconnection of said reversing drive from said staticnary guide while permitting continued rotation of said shaft and of said massaging brush, said sliding switch being further movable away from said other strand.

4,570,618

INTERVERTEBRAL BODY WIRE STABILIZATION

Kent K. Wu, Royal Oak, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Nov. 23, 1983, Ser. No. 555,361
Int. Cl.[4] A61F 5/00, 5/04
U.S. Cl. 128—69 9 Claims



1. The method of stabilizing the spine wherein a bone graft has been provided between spaced vertebral bodies which comprises
engaging preformed wire members having loops connected by wire with each loop engaging the transverse process of a vertebra,
forming the wire connecting loops in an arch extending posteriorly of the lamina, and
packing bone cement about the wire members and longitudinally between the lamina.

4,570,619

CLAVICLE BRACE

Paul B. Gamm, Cincinnati, Ohio, assignor to Jung Corporation, Cincinnati, Ohio

Filed Oct. 27, 1982, Ser. No. 437,108
Int. Cl.[4] A61F 5/02
U.S. Cl. 128—78 13 Claims

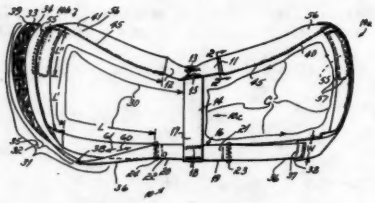
1. A shoulder brace for bracing a wearer's shoulders, said brace being of the type having a generally figure 8 configuration with right and left shoulder loops connected together to form said figure 8 configuration, the wearer's right and left arms being received through said right and left shoulder loops, respectively, when said brace is worn, said brace comprising
a first shoulder strap that defines one of said brace's shoulder loops, and a second shoulder strap that defines the other of said shoulder loops, each of said straps having a shoulder contact section and a doubled back section, each strap's shoulder contact and doubled back sections being connected one to the other, and said doubled back section of each strap being adapted to overlie its associated shoulder contact section on the anterior surface of a wearer's shoul-

der between the wearer's trapezius muscle and the wearer's axilla when said brace is worn,

a crossover strap connected to said first and second shoulder straps for maintaining said first and second shoulder straps in said generally figure 8 configuration,

a link fixed to said brace with said shoulder straps being slidable relative to said link for increasing or decreasing the size of said shoulder loops, the tightness or looseness of said brace on a wearer's shoulders being a result of the decreased size or increased size, respectively, of said shoulder loops, and

an adjustable fastener connected with each of said first and second shoulder straps, each fastener being partially carried by a shoulder contact section and partially carried by a doubled back section, said fasteners being connectable on the anterior surfaces of the wearer's shoulders between the wearer's trapezius muscle and the wearer's axilla, said



fastener associated with said right shoulder loop being adjustable to permit the size of said right loop to be decreased personally by the wearer by pulling said right loop's doubled back section in a direction that includes a forward directional component with the wearer's left hand as desired while the brace is being worn, and said fastener associated with said left shoulder loop being adjustable to permit the size of said left loop to be decreased personally by the wearer by pulling said left loop's doubled back section in a direction that includes a forward directional component with the wearer's right hand as desired while the brace is being worn, the pulling of each loop's doubled back section in a direction that includes a forward directional component simultaneously tightening that loop on the wearer's shoulder and providing a rearward thrust to the wearer's shoulder for pulling the wearer's shoulder rearwardly into a desired braced position.

4,570,620

ADJUSTABLE ORTHOPEDIC SHOE FOR A FOOT SPLINT

Robert J. Kurtz, New York, and Joseph LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 339,058, Jan. 13, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,584

Int. Cl.⁴ A61F *3/00*

U.S. Cl. 128—80 A **9 Claims**

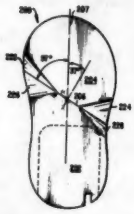
1. An orthopedic appliance comprising:

an orthopedic shoe having a longitudinal and axis and a lateral axis which are in a horizontal plane, said shoe being separated into a heel portion and a toe portion;

a heel plate to said heel portion is attached;

a toe plate to which said toe portion is attached;

adjusting means for adjusting the plane of said toe plate relative to the plane of said heel plate about a horizontal axis disposed at an angle only within the range, of 10° to 80° with respect to the longitudinal axis of said shoe; and



locking means for locking said toe plate relative to said heel plate in the adjusted position.

4,570,621

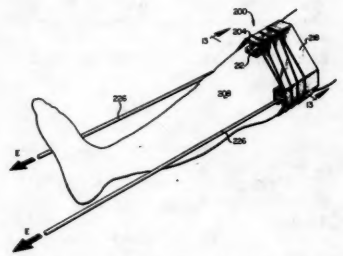
CIRCULO-SEGMENTAL SPANNING AND HOLDING APPARATUS

Frederico D. Guerriero, 7029 West Grand, Chicago, Ill. 60635

Continuation-in-part of Ser. No. 380,111, May 20, 1982, Pat. No. 4,409,971. This application Nov. 7, 1984, Ser. No. 669,010

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—84 C **17 Claims**



1. An orthopedic traction apparatus for application to a selected anatomical portion for applying traction, said apparatus comprising:

at least one traction line;

a plurality of circulo-segmental pressure plates intermittently disposed in spaced radial array about the selected anatomical portion whereby circulation is unimpeded in intervening areas between said plates, each said plate comprising a base portion comprising a fibrous material molded to conform to the contours of the selected anatomical portion and contoured to rest in substantially flat configuration against the anatomical portion, at least one pressure strap spanning means disposed elevated from said plate for inwardly directed pressure contact with a pressure strap, and means interconnecting said plate and said spanning means for retaining said spanning means in spaced elevation from said pressure plate means base portion;

at least one pressure strap for disposition radially about said circulo-segmental plates and in firm contact with said strap spanning means for exerting an inward pressure thereon for holding said plates sufficiently firmly against the anatomical portion to provide stable means for anchoring said at least one traction line; and

pivotably adjustable traction securement means attached to at least one of said circulo-segmental plates for allowing said at least one traction line to be adjustably angled for varying the longitudinal distribution of the inwardly directed pressure on said plates.

4,570,622
CONSTRUCTIONAL MATERIAL

Wulf von Bonin; Ulrich von Gizycki; Kuno Wagner, all of Leverkusen, and Dietmar Schäpel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 336,206, Dec. 31, 1981, Pat. No. 4,411,262, which is a continuation of Ser. No. 898,753, Apr. 21, 1978, abandoned, which is a continuation of Ser. No. 782,656, Mar. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 684,131, May 7, 1976, abandoned. This application Oct. 24, 1983, Ser. No. 545,013

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—90 **17 Claims**

1. A synthetic resin based substitute for plaster of paris medical bandaging or splinting material enclosed in a moisture-free and moisture impervious package comprising

(a) a flexible fiberglass substrate coated or impregnated with

(b) a reactive one-component system which is based on an aromatic polyisocyanate which:

(1) is free of oxycarbonyl isocyanate groups, urethane groups, urea groups, biuret groups and allophanate groups;

(2) contains less than about 1% by weight of volatile components which can be removed at 12 Torr and 20° C. in one hour;

(3) renders said impregnated or coated flexible fiberglass substrate into a rigid self-supporting structure of comparable mechanical strength to plaster of paris materials free of extensive foaming by reaction with water after forming into a planar or hollow configuration; and

(4) contains a sufficient amount of a catalyst for the reaction of isocyanate groups with water to give it a hardening time suitable for a substitute for plaster of paris medical bandaging or splinting materials,

said impregnated or coated fiberglass substrate remaining formable in storage.

4,570,623
ARCHED BRIDGE STAPLE

Arthur E. Ellison, Williamstown, Mass., and Rocco R. Borzone, Emerson, N.J., assignors to Pfizer Hospital Products Group Inc., New York, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,506

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 B **7 Claims**

1. A surgical bone staple comprising,

a bridge member joined at each end to a pointed leg having a longitudinal axis, the legs pointing in the same general direction and being in a plane substantially coplanar with said bridge member,

said bridge member being in the form of an arch when viewed both in said plane and perpendicular to said plane, having its concave surface facing said legs, the outer surface of the bridge member having a flattened planar section, substantially perpendicular to said longitudinal axes, which forms an impact head for driving the staple into a bone;

a plurality of pointed teeth depending from said concave surface and generally parallel to said legs, and teeth being substantially shorter than said legs, wherein the points of the teeth lie essentially in a plane substantially perpendicular to the legs at their upper ends, and

said arch having a rise of about 20% to about 50% of its span, whereby the center of said concave surface remains substantially spaced above a bone surface when said legs are driven fully into said bone.

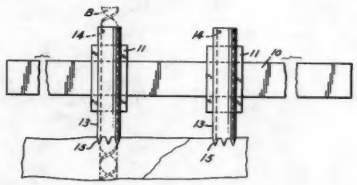
4,570,624
UNIVERSAL GUIDE FOR INSERTING PARALLEL PINS

Kent K. Wu, Royal Oak, Mich., assignor to Henry Ford Hospital, Detroit, Mich.

Filed Aug. 10, 1983, Ser. No. 521,682

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 EB **4 Claims**



1. A universal guide device for drilling and inserting surgical pins which comprises

an elongated bar having a non-circular cross section,

a plurality of blocks having complementary non-circular openings therethrough,

said bar extending through said non-circular openings and being slideable longitudinally on said bar,

means for locking each said block in position on said bar,

each said block supporting a cylindrical sleeve defining a cylindrical opening having its axis extending transversely of the longitudinal axis of the non-circular openings in said block,

said blocks being mounted on said bar such that the cylindrical openings are parallel to one another to form guide openings for drilling openings in bone for insertion of surgical pins,

each said cylindrical sleeve having a serrated end for engagement with the bone of a portion of the body for holding said sleeve in position during drilling of an opening and insertion of a surgical pin.

4,570,625
APPARATUS FOR EXTERNAL FIXATION OF BONE FRACTURES

John D. Harris, Abingdon, and Mervyn Evans, Kidlington, both of England, assignors to National Research Development Corporation, London, England

Division of Ser. No. 404,498, Aug. 2, 1982, Pat. No. 4,502,473. This application Oct. 19, 1984, Ser. No. 662,551

Claims priority, application United Kingdom, Aug. 6, 1981, 8124043

Int. Cl.⁴ A61F 5/04

U.S. Cl. 128—92 G **5 Claims**

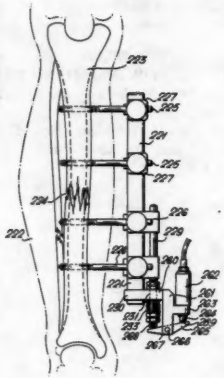
1. The method of using an external orthopaedic fracture fixator including a plurality of bone pins, and primary and secondary rigid supports therefor, which method comprises:

(a) transfixing opposed fragments of a bone relative to a fracture therein with respective different sets of said bone pins;

(b) securing said sets of bone pins with respective ones of said supports;

(c) interconnecting said supports to hold said fragments for reunion in a predetermined relationship aligned with an axis defined by said supports, while allowing relative bidirectional movements of said supports towards respective mutually expanded and contracted configurations thereof;

(d) imposing a first limit on said movement along said supports towards said expanded configuration, which said first limit corresponds with said predetermined relationship;



(e) continuously resiliently biasing said supports for relative movement towards said first limit;

(f) imposing a second limit on said movement of said supports towards said contracted configuration, with the extent of movement between said first and second limits corresponding to a movement of said fragments which encourages callous formation without inhibiting primary bone formation; and

(g) repetitively applying compressive force between said supports and between said fragments to move the former towards said second limit.

4,570,626

CORNEAL LIGHT SHIELD

John L. Norris, 70 Paseo Mirasol, Tiburon, Calif. 94920, and Lee K. Schwartz, 50 Corte del Bayo, Larkspur, Calif. 94939

Filed Jan. 20, 1984, Ser. No. 572,284
Int. Cl.[4] A61F *9/00*
U.S. Cl. 128—132 R **12 Claims**

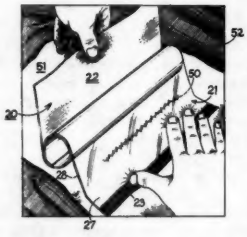
1. An apparatus for preventing high intensity light burns to the retina of an eye during the illumination and surgery on the eye, the apparatus comprising an opaque shield of diameter less than the diameter of the cornea of the operated upon eye, the shield having a concave contour disposed toward and complementary in shape to the cornea for resting thereon.

4,570,627

MEMBRANE DISPENSING ASSEMBLY AND METHOD OF MANUFACTURE

James S. MacConkey, Winchester, and Douglas F. Melville, Jr., Norwood, both of Mass., assignors to Acme United Corporation, Fairfield, Conn.

Filed Mar. 8, 1983, Ser. No. 473,311
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—132 D **15 Claims**



1. An easily handled, readily employable membrane dispensing assembly for use by a single person comprising

A. a self-supporting, self-contained, substantially cylindrically shaped roll incorporating

1. a first layer formed by a pressure sensitive, adhesive membrane, and

2. a second layer formed by a coated release paper, the coated surface of which is in intimate protective contact with the adhesive surface of the membrane; and

B. adhesive means

1. positioned between the non-adhesive surface of the first layer and the non-release coated surface of the second layer, for maintaining the substantially cylindrically shaped roll configuration, and

2. providing complete, controlled, incremental dispensing of the first layer from the second layer in any desired length for incrementally applying the first layer to the desired surface in easily controlled portions,

thereby achieving a membrane dispensing assembly which can be employed by a single individual and applied to a surface, with simplicity and ease by controllably pulling the layers in opposite directions and incrementally separating the first layer from the second layer and incrementally applying the first layer to the desired surface.

4,570,628

SURGICAL DRAPE

Richard M. Neal, 4193 W. Redondo Beach Blvd., Lawndale, Calif. 90260

Filed Feb. 13, 1984, Ser. No. 579,860
Int. Cl.[4] A61B *19/06*
U.S. Cl. 128—132 D **5 Claims**

1. A surgical drape comprising:

a main sheet having a torso covering section and a bottom section interconnected by a pair of side sections, said main sheet being constructed of an inherently soft material and sufficiently inexpensive material to be disposable;

each said side section forming a substantially enclosed area so as to function as a legging;

said main sheet having a fenestration generally centrally located therein;

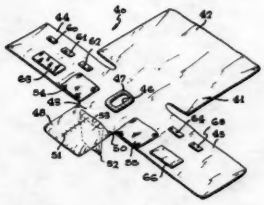
a fenestration strengthening material located entirely about said fenestration and attached to said main sheet, said fenestration strengthening material resisting tearing and cutting of the wall of said fenestration;

a layer of protective material attached to both said main sheet and said fenestration strengthening material, said layer of protective material to be nonliquid absorbing;

a collection container attached to said layer of protective material adjacent said bottom section, whereby said collection container is adapted to collect blood and solids which are discharged during the medical procedure;

said layer of protective material comprising a sheet of plastic;

said collection material comprising a flexible walled plastic bag;



said flexible walled plastic bag including means to ascertain volumetric measuring of the collected solids and liquids;

said means comprising measuring indicia located on said flexible walled bag;

a plurality of medical implement and supply holders arranged in fixed spaced apart relationship on each of said side section leggings for releasably retaining surgical implements and medical supplies; and

a second container having an open entrance carried immediately behind said first mentioned container and downwardly depending from said bottom section.

4,570,629

HYDROPHILIC BIOPOLYMERIC COPOLYELECTROLYTES, AND BIODEGRADABLE WOUND DRESSING COMPRISING SAME

Abe Widra, River Forest, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 358,994, Mar. 17, 1982, abandoned. This application Sep. 21, 1983, Ser. No. 534,486

Int. Cl.[4] A61M *5/20*

U.S. Cl. 128—156 **39 Claims**

1. A hydrophilic biopolymeric copolyelectrolyte comprising (a) a water-soluble linear anionic protein polyelectrolyte component derived from keratin, and (b) a water-soluble linear cationic biopolymer polyelectrolyte component derived from at least one biopclymer selected from the group consisting of a glucosaminoglycan and collagen.

4,570,630

MEDICAMENT INHALATION DEVICE

Roderick D. Elliott, Burnham, and Phillip J. Gardiner, High Wycombe, both of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

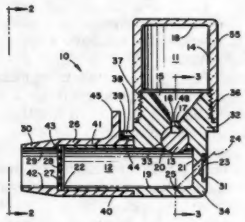
Continuation-in-part of Ser. No. 519,912, Aug. 3, 1983, abandoned, which is a continuation of Ser. No. 317,837, Nov. 3, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,787

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—203.15 **4 Claims**

1. An inhalation device comprising a medicament housing defining a medicament chamber therein capable of storing finely-divided medicament, said medicament housing having first and second opposite end walls and side wall means extending therebetween, said first end wall defining a bottom wall and having a central opening therein, said side wall means defining a passage extending from the opening in said first end wall to said second end wall, said passage comprising a first portion adjacent said second end wall and having a constant cross-section along the length thereof greater than the cross-section of said opening and a second portion extending from the first portion of said passage to said opening and tapering in cross-section from the cross-section of said first portion to the cross-section of said opening, said passage defining said medicament chamber, said medicament housing having means for permitting placement of medicament in said chamber;

an air inhalation housing defining an air inhalation chamber therein, said air inhalation housing including a tubular side wall means having a constant cross-section along the length therof, opposite first and second ends and a radial opening therein adjacent the first end thereof, said air inhalation housing further including an end wall with air inlet means formed therein at the first end of said tubular side wall means and being open at the second end of said tubular side wall means, said tubular side wall means, said end wall and said second open end defining said air inhalation chamber, an elongate mouthpiece having a screen mounted transversely therein connected to said second end, said air inlet means comprising a passage extending through said end wall at an oblique angle with respect to the plane of orientation of said end wall and being positioned such that the longitudinal axis of said passage intersects the wall of said tubular side wall means at a point directly opposite to and across from the opening therein; and



a substantially cylindrical medicament delivery member defining a recess of predetermined volume formed in the longitudinally extending exterior surface of said delivery member, said delivery member being rotatably mounted between the bottom wall of said medicament housing and the tubular said wall means of said air inhalation housing adjacent the radial opening therein such that the recess in said delivery member communicates with the opening in said medicament housing bottom wall in one position and the radial opening in said tubular side wall means in a second position whereby, when said medicament chamber is upright with the first end wall below the second end wall, said delivery member is horizontally rotatable between said first position wherein the recess therein communicates with said opening in the bottom wall of said medicament chamber so as to fill said recess with a predetermined dose of medicament from said medicament chamber and said second position wherein said recess communicates with the radial opening in the tubular side of said air inhalation housing so as to enable the predetermined dose of medicament to pass into said inhalation chamber, and inhalation of air from said air inlet means into said air inhalation chamber and out of said mouthpiece effects movement of said predetermined dose of medicament through said air inhalation chamber and out of said mouthpiece.

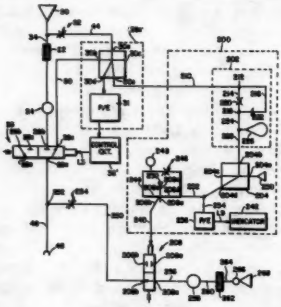
4,570,631
RESPIRATING GAS SUPPLY METHOD AND APPARATUS THEREFOR

Gerald Durkan, Altoona, Pa., assignor to Kircaldie, Randall and McNab (As Trustee), Wethersfield, Conn.

Division of Ser. No. 446,543, Dec. 3, 1982, Pat. No. 4,506,666. This application Mar. 25, 1985, Ser. No. 715,312

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.23 **4 Claims**



1. An apparatus for sensing negative pressure indicative of an inspiration in an in vivo respiratory system and for supplying gas to said in vivo respiratory system, said apparatus comprising:

means for sensing negative pressure in said in vivo system;

valve means operable for selectively supplying said gas to said in vivo system;

control means responsive to said sensing means for operating said valve means so that said gas is supplied to said in vivo system for at least a portion of the time duration of an occurrence of sensed negative pressure;

first timer means connected to said sensing means for determining when a first predetermined time interval has elapsed since the last occurrence of negative pressure in said in vivo system; and,

means responsive to said first timer means for dislodging an obstruction in an upper airway passage of said in vivo respiratory system by supplying a positive pressure pulse of gas into said in vivo system said pulse being supplied upon the elapse of said first predetermined time interval.

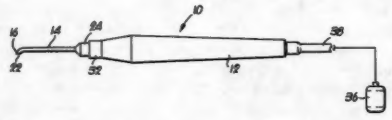
4,570,632
CYSTOTOME FOR EYE SURGERY AND METHOD OF OPENING LENS CAPSULE

Randall L. Woods, Lee's Summit, Mo.

Filed Mar. 16, 1984, Ser. No. 590,447

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **2 Claims**



1. In the surgical art of extracapsular cataract extraction, a cystotome for incising a continuous series of perforations in the anterior lens capsule of a human eye preparatory to removal of a portion of said anterior lens capsule within the confines of said perforations to provide a cataract clearance opening in said anterior lens capsule, said cystotome comprising:

an elongated tube having a lateral extension at one end thereof terminating in a flat, continuous, outermost surface adapted to be held by the surgeon flatly against said anterior lens capsule;

a flexible shaft in said tube and reciprocable along the longitudinal axis thereof;

a cutter on one end of the shaft and disposed for relatively short, repetitive strokes into and out of the extension beyond said surface during reciprocation of said shaft;

means for reciprocating the shaft,

said cutter being a relatively short, essentially poniard-shaped, triangular instrument having keenly sharpened edges coverging toward an outermost, sharp point for stabbing the capsule to present a smooth, sharp slice in absence of tearing.

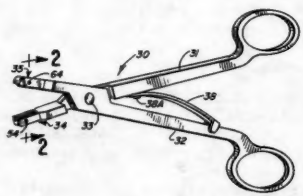
4,570,633
SURGICAL CLIP APPLIER INSTRUMENT ADAPTER JAWS

Donald M. Golden, Cherry Hill, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 306,436, Sep. 28, 1981, abandoned. This application Apr. 15, 1985, Ser. No. 723,602

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—325 **4 Claims**



1. In a medical instrument for applying a first type of ligating clip wherein said first type of clip has an extension configuration adapted to be engaged by said instrument and wherein said instrument includes two pivotally connected actuating members, each having on one end a handle and on the other end a jaw for receiving, holding, and applying said first type of clip, each of said jaws defining a channel disposed in confronting relationship with the channel of the other jaw and extending a rearwardly from the tip of the jaw, each said jaw including a side wall defining each side wall of the jaw channel, each jaw having a partially cylindrical recess extending across the width of the jaw channel to each jaw side wall, a bore defined through each said jaws side wall in registry with said partially cylindrical recess, the improvement comprising;

an adapter assembly provided with an adapter member associated with each said jaw to accommodate a second type of ligating clip having an extension configuration different than that of said first type of clip;

said adapter assembly including means for releasably securing said adapter members to said jaws through said bore in each side wall of a jaw; and

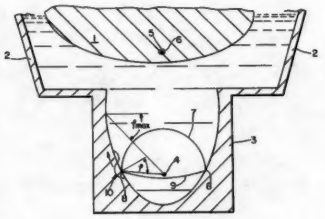
each adapter member including a clip applying means disposed on the portion of the adapter member extending beyond said means for releasably securing said adapter member to said jaws, said applying means being in facing relationship and adapted to receive, hold and apply said second type of clip.

4,570,634

SHOCKWAVE REFLECTOR

Othmar Wess, Immenstaad, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,203
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1982, 3241026
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—328 5 Claims



1. In a reflector for focusing, shockwaves in a coupling liquid in order to contactlessly comminute concretions in living bodies,

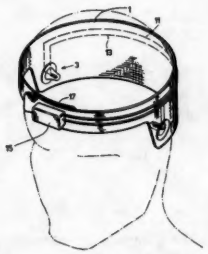
the improvement comprising interior reflecting surface means in which the speed of propagation c_{TO} of a transverse surface wave in said reflecting surface means is less than the speed of sound c_S in the coupling liquid filling the reflector.

4,570,635

ELECTRICAL DEVICE FOR ALLEVIATING EARACHE PAIN

Ronald Henig, 259 Maxwell St., Downsview, Ontario, Canada (M3H 5C1)

Filed Jan. 10, 1984, Ser. No. 569,724
Int. Cl.[4] A61F *7/12*
U.S. Cl. 128—380 5 Claims



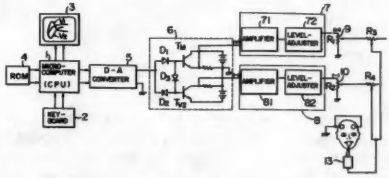
1. A device to alleviate earache pain, said device comprising a headband, a pair of ear plugs extending inwardly from opposing sides of said headband for fitting into an ear canal, said ear plugs each comprising a heat generating member surrounded by a heat conductive material which is soft and malleable for both substantially conforming to and warming the ear canal by heat from said heat generating member, and an electrical power source for operating the heat generating members of the ear plugs, each ear plug comprising a heating coil, a gel filled portion around said heating coil, and an outer flexible ear opening portion for maintaining heat from said heating coil within the ear.

4,570,636

METHOD OF ELECTRICALLY SYNTHESIZING SENSE OF TASTE

Isoji Kurose, Iwakuni 3958-13, Tsurumiku, Beppu-shi, 874, Japan

Filed Jun. 6, 1984, Ser. No. 617,881
Claims priority, application Japan, Jun. 10, 1983, 58-104006
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 R 3 Claims



1. A method of electrically synthesizing the sense of taste, comprising:

a first step of previously determining time-varying, gustatory potential curves representative of each of saltiness, bitterness, sweetness, and sourness;

a second step of generating first and second voltage outputs, said first and second voltage outputs having substantially the same time-potential characteristics as said gustatory potential curves representative of saltiness and bitterness, respectively;

a third step of performing a sampling operation for said first and second voltage outputs, and combining the sampled voltages so that a composite output of said sampled voltages has substantially the same time-potential characteristics as said gustatory potential curve representative of one selected from sweetness and sourness, to generate a third voltage output; and

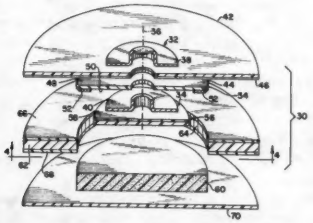
a fourth step of applying the third voltage output to the lingual papilla of a person.

4,570,637

ELECTRODE

Robert L. Gomes, West Boxford, and Joseph P. Maffione, Cambridge, both of Mass., assignors to Andover Medical Incorporated, Lowell, Mass.

Filed Oct. 20, 1983, Ser. No. 543,695
Int. Cl.[4] A61B *5/04;* A61N *1/04*
U.S. Cl. 128—639 12 Claims



1. In a medical electrode of the type including an electrically conductive stud member and a first electrically conductive material for electrically coupling the electrode to skin the improvement comprising:

a substrate including a second electrically conductive material substantially chemically inert with respect to said first electrically conductive material and electrically coupled to said stud member, and a layer of a third electrically

conductive material ionically reactive with said first electrically conductive material when current is transmitted therebetween, said layer being disposed on said substrate physically spaced from said stud member and electrically interfacing with said first electrically conductive material so as to define an electrical path from said first electrically conductive material, through said layer to said second electrically conductive material and from said second electrically conductive material to said stud member.

4,570,638

METHOD AND APPARATUS FOR SPECTRAL TRANSMISSIBILITY EXAMINATION AND ANALYSIS

Hugh F. Stoddart, Groton, Mass., and Gary D. Lewis, St. Clair Shores, Mich., assignors to Somanetics Corporation, St. Clair Shores, Mich.

Filed Oct. 14, 1983, Ser. No. 542,022
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—665 **47 Claims**

1. Apparatus for obtaining optical response data from selected body portions of individual subjects indicative of the intrinsic internal physiological state of tissue within such body portions, comprising:

a manually-manipulatable test instrument having at least first and second component members mounted for movement relative to one another and support means disposed therebetween for holding such members in selected mutually spaced relative positions;

said first component member including light source means for emitting selected light from said first member;

said first component member being adapted to fit closely against a selected body portion from which clinical data is desired to be obtained, in a manner to project said emitted light into the interior of such body portion;

light-receiving means carried by at least said second component member for receiving at least part of the light projected into said selected body portion;

said support means including position-variable elements for movement of one of said component members relative to the other to change the nominal optical distance between said source and said light-receiving means;

means operatively coupled between said light source means and said light-receiving means for measuring the particular length of said nominal optical distance at various positions of said relative movement which effects change in such distance;

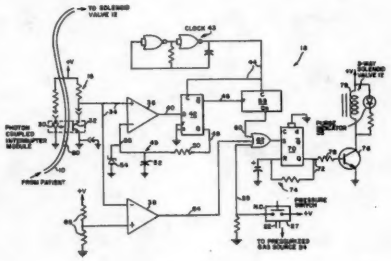
and means for producing signals for computation representative of the nominal optical distance determined by said length-measurement means.

4,570,639

DISCONTINUITY DETECTOR

Saul Miodownik, Bronx, N.Y., assignor to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,523
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—718 **14 Claims**



1. A discontinuity detector comprising:

a. sensor means for response with a sensor signal to a discontinuity in a medium moving relative to the sensor;

b. a clock pulse generator which generates clock pulses;

c. modulation means responsive to the clock pulses for providing a periodic signal and responsive to the sensor signal for interrupting the periodic signal; and

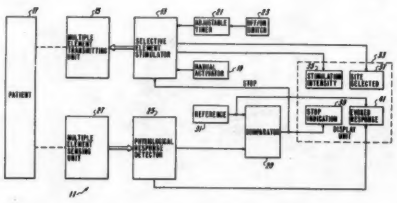
d. a counter incremented by the clock pulses and reset by the periodic signal, whereby a count in the counter higher than that reached in the normal period of the periodic signal indicates a discontinuity.

4,570,640

SENSORY MONITORING APPARATUS AND METHOD

John E. Barsa, 122 Martinique, Tampa, Fla. 33606

Continuation of Ser. No. 290,543, Aug. 6, 1981, abandoned. This application Apr. 16, 1984, Ser. No. 601,001
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—741 **30 Claims**



1. An apparatus for determining sensory system pathway blocks related to preselected areas of the body of a patient by stimulating predetermined anatomical skin areas, said apparatus comprising:

a stimulating and sensing unit including stimulating means for stimulating peripheral receptors at said predetermined anatomical skin areas to thereby stimulate segmental associated pathways at the input side of the central nervous system so that the central nervous system can receive said stimulation from said peripheral receptors through unblocked ones of said segmental associated pathways and can receive no said stimulation from said peripheral receptors through blocked ones of said segmental associated pathways, said stimulating and sensing means also including sensing means receiving responses from the output side of the central nervous system, and said stimulating

and sensing means having a plurality of elements and positioning means for adapting said elements to be positioned contiguous to the body of a patient along said predetermined anatomical skin areas so that, upon actuation of said stimulating means, a response can be detected at said sensing means, with respect to said unblocked ones of said segmental associated pathways, indicative of at least one predetermined physiological characteristic of said preselected areas of the body of the patient:

means for activating said stimulating means of said stimulating and sensing means;

response processing means connected with said sensing means of said stimulating and sensing means for receiving said responses from said sensing means and providing an output indicative of the interruption pattern at said preselected areas of the body of the patient as determined by said sensed blocked and unblocked pathways; and

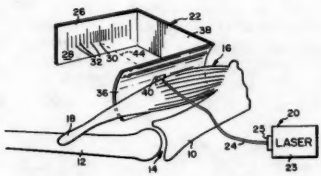
utilization means for receiving said output indicative of said interruption pattern from said response processing means and responsive thereto forming an indication thereof.

4,570,641

SURGICAL MYOMETER METHOD

Richard L. Lieber, Cardiff-By-The-Sea, and Ronald J. Baskin, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed May 29, 1984, Ser. No. 614,941
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—774 **8 Claims**



1. In a surgical setting, where a detached, striated muscle is to be attached between anatomical connection sites, a method for placing the muscle at an optimal length when said muscle attachment is made surgically, comprising the steps of

illuminating a bundle of fibers from said muscle with monochromatic light,

by said illumination, producing a diffraction pattern including a plurality of lines resulting from the diffraction of said light by the fibers of said bundle,

determining the distance between two of said lines in said diffraction pattern,

comparing said distance with a predetermined diffraction line distance corresponding to said optimal length,

adjusting the muscle length to reduce the diffraction between said determined distance between said two lines and said predetermined diffraction line distance, and

repeating said steps of determining, comparing, and adjusting until the difference between said determined distance and said predetermined diffraction line distance is less than a preselected value.

4,570,642

ENDOCARDIAL EXTENDABLE SCREW-IN LEAD

Lawrence M. Kane, Roseville, and James E. Revane, Minnetonka, both of Minn., assignors to Daig Corporation, Minnetonka, Minn.

Filed Sep. 23, 1983, Ser. No. 535,318
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—785 **6 Claims**

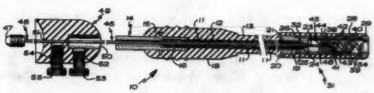
1. An intravascular endocardial lead formed of a material inert to body fluids, comprising:

an elongate, electrically insulated, flexible conductor having a lumen throughout the length thereof, and having proximal and distal ends,

a connector element electrically connected to the proximal end of said conductor,

an elongate, hollow electrode electrically connected to the distal end of said conductor and adapted to contact the endocardium,

a helix assembly positioned in said electrode and including a sealing member formed of a yieldable, electrically nonconductive material engaging the interior of said electrode in fluid-sealing relation therewith, an elongate helical element having a proximal end portion secured to said sealing member and projecting distally therefrom, said



helix assembly being longitudinally but non-rotatably shiftable from a retracted position wherein said helical element is disposed completely within the electrode, to an extended position wherein said helical element projects outwardly of the distal end of said electrode,

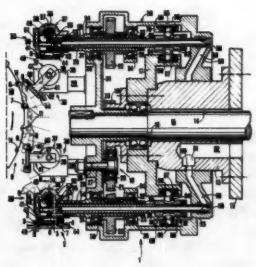
an elongate stylet having proximal and distal ends and being inserted into the lumen of the conductor and engaging the helix assembly for shifting the same from the retracted position to the extended position whereby when said helix assembly is in the extended position and said conductor, electrode and helix assembly are rotated as a unit about said stylet, said helical element will penetrate the cardiac tissue and urge the electrode into positive engagement with the cardiac tissue.

4,570,643

METHOD FOR TRANSFERRING CIGARETTE PIECES

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

Filed May 24, 1982, Ser. No. 381,045
Claims priority, application Italy, Jun. 5, 1981, 48620 A/81
Int. Cl.[4] A24C *5/00, 5/32*
U.S. Cl. 131—94 **8 Claims**



1. A method for transferring cigarette pieces (6, 7) from a double rod cigarette manufacturing machine (2) to a filter fitting machine (9), said manufacturing machine (2) being provided with an exit station comprising a bench (5) along which two cigarette rods (3, 4) cut into pieces (6, 7) are fed along parallel paths, said filter fitting machine (9) being provided with an inlet station comprising a conveyor (10) provided with grooves (11) parallel to said rods (3, 4) and arranged to receive said pieces (6, 7), said method comprising the following steps:

moving a withdrawal element (42) along an annular path extending about a first axis parallel to said bench (5) and

perpendicular to said rods (3,4), said withdrawal element being arranged to simultaneously withdraw at least one of said pieces (6, 7) from each of said rods (3, 4),

said annular path being substantially tangential to said bench (5), and said withdrawal element (42) being arranged to lie in a position facing said bench (5) when at the point of tangency; and

rotating said withdrawal element (42), through a predetermined angle, about a second axis (39) parallel to said rods (3, 4) during its movement along a part of said annular path which is disposed downstream of said point of tangency so that the withdrawal element is positioned to face said conveyor (10).

4,570,644

CIGARETTE MAKING MACHINE HOPPER

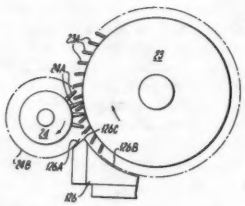
Ronald A. Abern; Derek H. Dyett, both of High Wycombe, England; Francis A. M. Labbe, Neuilly-sur-Seine, France, and Godfrey A. Wood, High Wycombe, England, assignors to Molins PLC, London, England

Filed Jul. 9, 1982, Ser. No. 396,879

Claims priority, application United Kingdom, Jul. 11, 1981, 8121462

Int. Cl.⁴ A24C *5/39*

U.S. Cl. 131—109 R **23 Claims**



15. A hopper for a cigarette making machine comprising:

(a) spaced downwardly extending walls defining a channel therebetween for receiving tobacco delivered through the upper end of said channel;

(b) a carded roller mounted for rotation to feed tobacco continuously from the lower end of said channel;

(c) a picker roller adjacent said carded roller and mounted for rotation to remove tobacco from said carded roller during rotation of said carded and picker rollers;

(d) conveyor means spaced from one side of said carded and picker rollers; and

(e) means defining a substantially flat land having one end thereof at a position adjacent to the intersection of the perimeters of said carded and picker rollers in the region where said tobacco is removed from said carded roller by said picker roller and extending from said position adjacent to and spaced from the perimeter of said picker roller;

(f) said picker roller being arranged to rotate such that the perimeter thereof moves in a direction from said one end of said flat land along said flat land to project tobacco removed from said carded roller along said flat land and onto said conveyor means.

4,570,645

SAFETY HOLDER FOR CIGARETTES

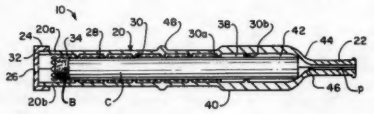
William E. Newman, Sr., 207 Doncaster Rd., Joppa, Md. 21085, and Paul D. Newman, 7 Nacelle Rd., Baltimore, Md. 21220

Filed Dec. 2, 1983, Ser. No. 557,442

Int. Cl.⁴ A24F *13/16*

U.S. Cl. 131—175 **1 Claim**

1. A system for fire safe guarding of a burning end of a cigarette, comprising: means for enclosing a cigarette with a burning end, means for drawing air for combustion through a said cigarette, from the burning end along the length of the cigarette, means for extinguishing the burning end of a said cigarette at any of a plurality of predetermined times in the absence of said drawing of air through the cigarette; the system having first and second ends, the means for drawing air including a plurality of circumferential rows of apertures through the means for enclosing adjacent said first end, a mouthpiece at said second end, said means for extinguishing including an axially spaced series of internal rings, in said means for enclosing and dividing the circumferential rows of apertures into



groups, each internal ring proportioned for fitting around a portion of a cigarette and cooling it and depriving it of air to the point of extinguishment in said absence of drawing of air; said means for enclosing including a tubular body, said tubular body comprising substantially identical halves taken along a longitudinal plane, and separable for loading a cigarette therein, means holding said halves together including a cap on said first end, and means for reducing possibility of smoking a cigarette too short, comprising a portion of said tubular body adjacent the mouthpiece being without said apertures.

4,570,646

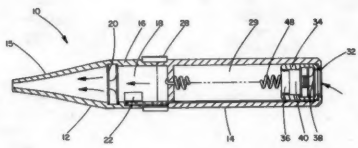
METHOD AND APPARATUS FOR SMOKING

B. Keith Herron, 504 Hamlin Park, Chapel Hill, N.C. 27514

Filed Mar. 9, 1984, Ser. No. 588,060

Int. Cl.⁴ A24F *3/00, 13/00*

U.S. Cl. 131—185 **20 Claims**



1. A smoking apparatus comprising: .

A. a tobacco holding structure for receiving and holding tobacco material to be smoked including an inlet and an outlet wherein during the smoking process an individual may draw and induce air into and through said inlet, through the tobacco holding structure and the tobacco material therein and out said outlet;

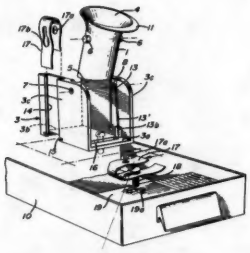
B. means associated with said tobacco holding structure for burning said tobacco material contained therein; and

C. means for limiting and controlling the burning rate of the tobacco material contained within said tobacco holding structure, said means for limiting and controlling the rate of burning of the tobacco material including a normally closed chamber having tobacco material of said tobacco holding structure contained therein and wherein said normally closed chamber includes normally closed valve means for opening in response to the individual drawing and inducing air into said tobacco holding structure for enabling fresh air containing oxygen to be induced and drawn into said normally closed chamber during the tobacco burning process, and wherein the burning process is limited by the amount of oxygen within said normally closed chamber at any one time and wherein after the oxygen within said chamber has been depleted the smoking process can only be continued by the individual inducing additional air within said normally closed chamber.

4,570,647
CIGARETTE EXTINGUISHER FOR AUTOMOBILE

Michel Pater, 475 Villeneuve O., Montreal, Canada (H2V 2R8)

Filed Mar. 5, 1984, Ser. No. 586,328
Int. Cl.[4] A24F *19/14*
U.S. Cl. 131—237 3 Claims



1. A cigarette extinguisher and ash-tray combination for use in an automobile, comprising:

a support, including a bight portion and a pair of upright spaced legs;

an ash-tray defining a bottom and side walls;

means connecting said support to said ash-tray with said bight portion spaced above the bottom of said ash-tray;

an open-ended cylindrical snuffer tube having a top inlet end, for insertion of a lighted cigarette, and a bottom bevelled outlet end, for discharge of said cigarette into said ash-tray; said tube having a pair of diametricallyopposite pivot pins protruding outwardly therefrom intermediate the ends thereof, said legs having registering holes receiving said pivot pins for pivotal action of the tube thereabout in between as inclined cigarette extinguishing position in which said bottom bevelled end abuts said bight portion and a more-inclined cigarette-discharging position in which said bottom bevelled end clears said bight portion and

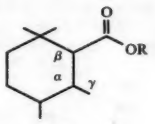
a coil spring surrounding one of said pivot pins between said tube and one of said legs and having straight end portions removably attached to said tube and to said one leg respectively, and biased to press the bottom outlet of said snuffer tube against said bight portion in said cigarette-extinguishing position, and prevent play of said snuffer tube relative to said support despite the vibrations imparted to said extinguisher during movement of the automobile carrying said ash-tray.

4,570,648
FLAVORANTS CONTAINING ESTERS OF 2,3,6,6-TETRAMETHYLCYCLOHEXENYL CARBOXYLIC ACIDS

Hanspeter Schenk, Zumikon, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 156,432, Jun. 4, 1980, Pat. No. 4,375,001. This application Sep. 7, 1982, Ser. No. 415,513
Claims priority, application Switzerland, Jun. 13, 1979, 5527/79; Apr. 24, 1980, 3163/80
Int. Cl.[4] A24B *3/12*
U.S. Cl. 131—276 10 Claims

6. A tobacco to which there has been added a flavoring effective amount of an ester of the formula

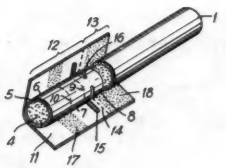


wherein R represents C_{1-4}-alkyl or C_{2-4}-alkenyl and one of the three broken lines represents an additional bond.

4,570,649
FILTER CIGARETTE

Walter A. Nichols, and Reginald W. Newsome, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 429,354, Sep. 30, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,600
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 12 Claims



1. A filter cigarette, comprising a substantially cylindrical tobacco rod, a substantially cylindrical filter plug, a plug wrap circumscribing the filter plug, and a tipping paper circumscribing the plug wrap and a portion of the tobacco rod, at least one of said plug wrap and said tipping paper being substantially air-impermeable, wherein the tobacco rod and the wrapped filter plug have substantially the same cross-sectional area and shape, the filter plug has a rod end and a mouth end open to permit passage of air and smoke, the tobacco rod and the wrapped filter plug are axially aligned in abutting, end-to-end relation, the plug wrap comprises, in sequence, abutting mouth-end, central, and rod-end bands, the rod-end band has a first opening therein, the rod-end band and the mouth-end band are fixed to the filter, the center band is rotatable about the longitudinal axis of the filter plug, the tipping paper comprises a first band and an abutting second band, the first band extends from the mouth end of the filter plug to a position overlying the rod-end band and is attached only to the central band for rotation therewith, the first band has a second opening therein positioned such that rotation of the first band rotates the second opening into varying degress of registry with the first opening, and the second band extends from the first band to a position on the tobacco rod and joins the tobacco rod to the wrapped filter plug.

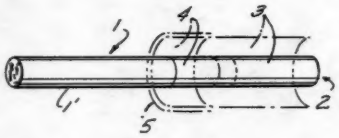
4,570,650
CIGARETTE

Vladimir Sirota, 263 Congressional La., Rockville, Md. 20852

Filed Jul. 28, 1983, Ser. No. 518,058
Int. Cl.[4] A24D *1/02, 1/10, 1/11*
U.S. Cl. 131—349 11 Claims

1. A cigarette, comprising a front part including a tubular member which is composed of a cigarette paper, and a tobacco filler accommodated in said tubular member, said front part having front and rear ends and a predtermined length therebetween; a rear part extending rearwardly from said rear end of said front part and having a filter, said front part and said rear part being in abutting relationship to one another over said rear end of said front part and a front end of said rear part; and a

one-piece element extending over said rear part and further forwardly beyond said rear end of said front part over said front part partially over its length, said one-piece element immovably connecting said rear part with said front part and



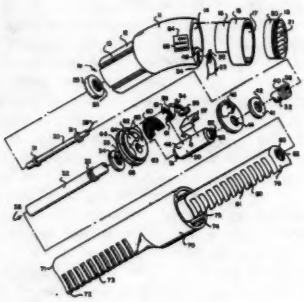
being provided with a fire resistant layer applied over at least a portion of its length, so that said one-piece element forms simultaneously a tubular connector connecting said front and rear parts with one another and a tubular coating which extinguishes a tobacco fire after burning of said front part.

4,570,651

COMBINATION PRESSING COMB DRYER AND BLOW DRYER

Charles R. Adams, 1932 W. 25th St. #12, Los Angeles, Calif. 90018

Filed Nov. 16, 1984, Ser. No. 672,126
Int. Cl.[4] A45D *1/00*
U.S. Cl. 132—9 **8 Claims**



1. For use in styling hair a combination pressing comb and blow dryer comprising:

an elongated housing defining an internal cavity and having,

a first end defining a first plurality row of teeth and a first plurality of serrations spaced between each of said teeth in said first plurality of teeth, said first plurality of serrations permitting air passage between the exterior of said elongated housing and said internal cavity,

a second end defining an air nozzle having an opening coupled to said internal cavity;

a heat conductive interior comb defining a second plurality of teeth and a second plurality of serrations spaced therebetween and supported within said internal cavity such that said first and second plurality of serrations are in substantial alignment;

means for electrically heating said interior comb;

an electrically driven air impeller supported within said internal cavity; and

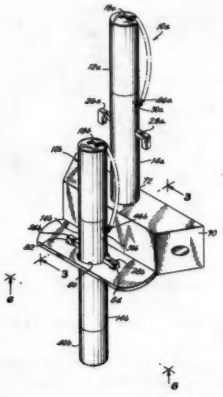
control means, supported by said elongated housing, for controlling the temperature of said interior comb and said electrically driven air impeller.

4,570,652

TOOTHBRUSH CONTAINER

Michael Chavez, 673 E. 137th St. #1B, Bronx, N.Y. 10454

Filed Aug. 1, 1983, Ser. No. 519,386
Int. Cl.[4] A45D *44/18;* **B65D** *83/10*
U.S. Cl. 132—84 R **7 Claims**



1. A toothbrush container assembly for holding a toothbrush comprising:

a base for supporting the assembly, and including first and second apertures, and a slot adjacent said first aperture, therein; and

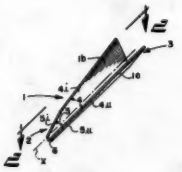
a toothbrush container including: a housing having at least one interior shoulder; a cap adapted to engage a first end of said housing; a bottom member adapted to engage a second end of said housing; and securing means, including a hook for engaging said slot, mounted on the exterior of said housing for securing said toothbrush container to said base.

4,570,653

TOOTH CLEANING AND FLOSSING DEVICE

James B. Wolf, 3495 Kersdale Rd., Pepper Pike, Ohio 44124

Filed Sep. 6, 1984, Ser. No. 647,969
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—91 **20 Claims**



1. A dental device, comprising an elongate structure having opposite sides oriented generally in parallel with respect to an elongate axis and angularly with respect to each other, each side having a leading edge surface inclined to such elongate axis for wiping against at least one of a tooth surface and relatively adjacent gum, each side having an outer surface, said outer surfaces being positioned for simultaneously wiping against the proximal surfaces of respective teeth, and said structure having a resiliency characteristic, whereby said outside surfaces are resiliently urged against respective proximal areas of respective teeth during use; and at least one of a foam

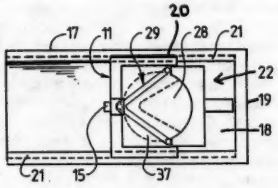
material, abrasive material or adhesive material on at least part of each of said opposite sides of said structure.

4,570,654

COIN COUNTING APPARATUS

Adolf J. Bahr, Railway Parade, St. Lawrence, Queensland, Australia (4707)

Filed Jul. 10, 1984, Ser. No. 629,453
Claims priority, application Australia, Jul. 15, 1983, PG0310
Int. Cl.[4] G07D *9/06*
U.S. Cl. 133—1 A **6 Claims**



1. Coin counting apparatus including:

a resiliently deformable frame adapted to support a plurality of coins;

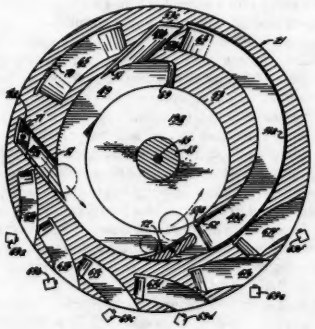
support means for supporting the resilient frame; abutment means for causing resilient deformation of said frame upon relative movement between the resilient frame and said abutment means so that said frame provides support for said coins, said support means including an elongate support housing having a continuous side wall and an access opening located within said wall, and said abutment means including an abutment wall wherein said resilient frame may be located within said support housing and said plurality of coins located adjacent the abutment wall, whereby with relative movement between the support housing and abutment wall, said resilient frame may engage said plurality of coins in snap fit relationship.

4,570,655

APPARATUS AND METHOD FOR TERMINATING COIN SORTING

Donald E. Raterman, 1345 Carol La., Deerfield, Ill. 60015

Filed Sep. 28, 1983, Ser. No. 536,686
Int. Cl.[4] G07D *3/14*
U.S. Cl. 133—3 A **20 Claims**



14. A coin sorting apparatus comprising:

a pair of substantially parallel horizontal disks forming a pair of opposed surfaces which have at least portions thereof spaced slightly away from each other to form a region which permits coins to slide between the opposed surfaces,

one of said disks being stationary and the other disk being mounted for rotation about an axis that is substantially perpendicular to said opposed surfaces, the rotatable disk having a resilient biasing surface for urging coins pressed therein toward the opposed surface of the stationary disk, said stationary disk having a central opening for allowing batches of mixed denomination coins to be introduced to a staging area on the surface of said rotating disk,

means for providing a signal indicative of the presence of a predetermined condition, and

the stationary disk having a plurality of recessed areas therein for releasing any coins entering any recessed areas from the biasing pressure of said resilient surface and thereby permitting radial movement of coins between the two disks by rotation of the rotatable disk, said recessed areas being (1) shaped to allow coins into the region between said disks, (2) provided with means to block coins from entering said region in response to said signal in order to prevent stacking of coins in said region, (3) shaped to guide coins in single file along an arcuate path between the disks, (4) provided with means to recirculate coins radially inwardly in response to said signal in order to remove coins from said region and return them to the staging area of said rotating disk, and (5) shaped to permit coins of different sizes to escape radially from between the disks to different predetermined positions around the periphery of the stationary disk.

18. A method for terminating the sorting of coins by a stationary disk and a rotating disk mounted with their surfaces parallel to and in close proximity with one another, said method comprising the steps of:

rotating the coins on said rotating disk,

radially outwardly guiding the coins along a single file circumferential sorting path in the region between said stationary and rotating disks so as to position the radially inner edge of each coin denomination at a unique radial position in said region,

intercepting each denomination at its unique radial position and discharging that denomination from said region at discrete locations along the periphery of the stationary disk for each denomination,

sensing a predetermined condition,

redirecting said coins in said single file circumferential sorting path in said region at a first location of the path in response to said sensed predetermined condition so as to stop further exiting of sorted coins from said region at the periphery of the stationary disk,

redirecting said coins in said single file circumferential sorting path in said region at a second location of the path which is upstream from said first location in order to inhibit backlogging in said sorting path at said first location and thereby prevent stacking of coins in said region, and

retarding the rotational movement of the coins in the center of the stationary disk in response to the sensed predetermined condition so as to prevent coin abrasion.

4,570,656

METHOD OF TRANSPORTING VISCOUS HYDROCARBONS

William J. Matlach, St. Louis; Michael E. Newberry, Chesterfield, and Charles L. Thierheimer, Jr., St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 5, 1983, Ser. No. 491,821
Int. Cl.[4] F17D *1/17*
U.S. Cl. 137—13 **32 Claims**

1. In a method of enhancing the transportability through a pipeline of viscous hydrocarbons containing at least 10–15 percent water which comprises a step of adding a low viscosity hydrocarbon diluent to said viscous hydrocarbons to reduce the viscosity thereof, the improvement comprising adding to

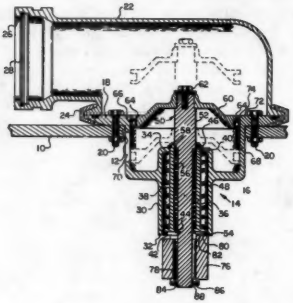
said diluent an effective oil-in-water emulsion-forming amount of a surfactant in at least one nonaqueous solvent therefor, adding the surfactant/solvent/diluent to said viscous hydrocarbons in the absence of added water, forming an oil-in-water emulsion of said viscous hydrocarbons and said water in said pipeline and transporting said emulsion through said pipeline.

4,570,657

TANK VENT VALVE

Russell L. Rogers, Munith, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Jul. 16, 1984, Ser. No. 631,238
Int. Cl.[4] F16K *17/196, 17/36*
U.S. Cl. 137—39 **7 Claims**



1. A normally closed vent valve for closed tanks comprising, in combination, a body having a substantially vertical axis adapted to be mounted within an opening in the top of a tank, an inner port defined in said body for communication with the tank interior, an outer port defined in said body in communication with the atmosphere, an elongated valve stem having an upper end mounted on said body for vertical movement in a direction substantially parallel to said body axis, a valve mounted on said valve stem upper end for movement therewith between normal, and egress and ingress venting positions, a valve seat defined on said body intermediate said inner and outer ports, said valve engaging said seat at its normal position sealing said inner port from said outer port and the atmosphere, a first compression spring encompassing said stem biasing said stem and valve toward said ingress vent position, a second compression spring encompassing said stem concentric with said first spring and located within said first spring biasing said stem and valve toward said egress vent position, said spring comprising counterbalance means to counterbalance the weight of said valve stem and valve whereby an increase in gaseous pressure within the tank raises said valve to said egress vent position, and a decrease in gaseous pressure within the tank lowers said valve to said ingress vent position.

4,570,658

PYROTECHNIC-ACTUATED DUAL AIR VALVE

Charles F. Dean; Edward W. Lauer, and David L. Riggs, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

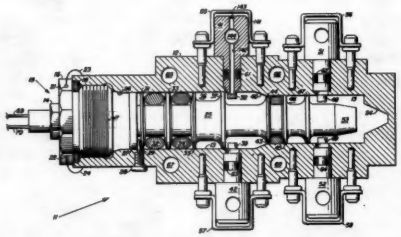
Filed Aug. 15, 1983, Ser. No. 523,499
Int. Cl.[4] F16K *31/12, 11/06*
U.S. Cl. 137—68.2 **1 Claim**

1. A dual air valve, comprising:

a housing defining a longitudinal central bore, open at one end and closed on one end, and having a threaded section adjacent said open end, a first diameter bore section extending from said threaded section toward said closed end and a second diameter bore, smaller than said first diameter bore, extending from said first diameter bore section to said closed end, and a truncated conical socket terminating said longitudinal central bore, said housing further defining a first transverse bore completely penetrating said housing at said first diameter bore section, and a second transverse bore completely penetrating said housing at said second diameter bore section;

a valve piston defining a base on one end, first, second, third, fourth, fifth, sixth, seventh and eighth flanges, each being spaced from one another, and a truncated conical tip on the other end compatible with said truncated conical socket in said housing, said first flange defining said base, said first and second flanges defining a slot therebetween, said fifth and eighth flanges defining first and second flange knives, respectively, said valve piston being slidably positioned within said housing for movement between a stored and an actuated position, said first and second flange knives being positioned to move past said first and second transverse bores when said valve piston moves from said stored position to said actuated position, said fourth and fifth flange pair and said seventh and eighth flange pair each defining a space between each flange in each pair for fluid flow when said valve piston is in said actuated position, said fourth and fifth flange pair being positioned to align the space between them with said first transverse bore in said actuated position and said seventh and eighth flange pair being positioned to align the space between them with said second transverse bore in said actuated position;

an electrically initiated high pressure gas generating squib



threadedly attached to said threaded section of said housing adjacent said valve piston base, closing said housing open end, and being responsive to an electric signal for pressurizing said base of said valve piston;

a shear pin installed in said housing and partially positioned in said slot between said first and second flanges for releasably retaining said valve piston in said store position;

a plurality of sealing rings positioned about said valve piston between each of said second and third flanges, said third and fourth flanges, and said sixth and seventh flanges, respectively, forming a respective plurality of seals between said valve piston and said housing;

four port bodies each having a central passageway open near one end and extending to a closed, shearably openable tip at the other end, said bodies having a circumferential groove disposed near said shearably openable tip, each of said port bodies being inserted into said housing one in each end of said first and second transverse bores and each of said shearably openable tips extending into said longitudinal central bore for shearing interaction with said flange knives upon motion of said valve piston from said stored position to said actuated position;

a sealing ring disposed around each of said port bodies at said groove for sealing between each of said port bodies and said housing; and

means for removably retaining said port bodies within said transverse bores;

whereby said shear pin retains said valve piston in said stored position until an electric signal causes said squib to

ignite and pressurize said valve piston base with high pressure gas, causing said first flange to shear said shear pin, and forcing said valve piston to move toward said closed end of said housing and said first flange knife to shear open said tips of said port bodies in said first transverse bore, and said second flange knife to shear open said tips of said port bodies in said second transverse bore, aligning said first and second spaces for fluid flow with said first and second transverse bores respectively, said valve piston truncated conical tip frictionally lodging in said housing truncated conical socket for secure retention of said valve piston in said actuated position, resulting in open flow passages through said first and second transverse bores and inserted port bodies.

4,570,659

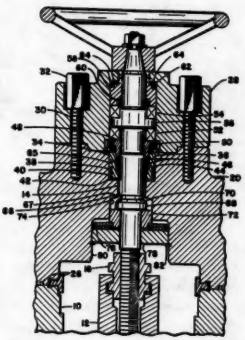
FIRE RESISTANT VALVE

Michael A. Karr, Jr., Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Nov. 1, 1983, Ser. No. 547,803

Int. Cl.[4] F16K *17/38, 41/14*

U.S. Cl. 137—72 **3 Claims**



1. A fire resistant valve having a valve body, a valve member in said body, a bonnet and a normally non-rising actuating stem for said valve member extending through a bore in said bonnet, a backseat arrangement between the stem and the bonnet, fusible means normally maintaining said backseat arrangement in a non-seating position by permitting the same to move into a seating position upon melting, a stem seal packing replaceable while the bonnet and stem remain in position, said packing being disposed between said stem and bonnet at a location outwardly of said backseat arrangement and spring means interposed between said stem and bonnet at a location inwardly of said stem seal packing effective to bias said backseat arrangement into seating position to thereby provide positive seating of the back seat during replacement of said packing.

4,570,660

VACUUM SLEEVE VALVE

Daniel J. V. D. Chauvier, P.O. Box 11325, Selcourt, Springs, Transvaal Province, South Africa

Filed Oct. 31, 1984, Ser. No. 666,965

Claims priority, application South Africa, Nov. 11, 1983, 83/8433

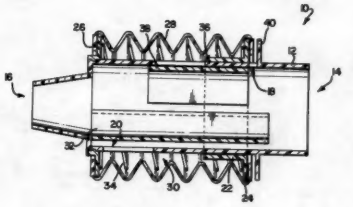
Int. Cl.[4] G05D *11/03*

U.S. Cl. 137—114 **9 Claims**

1. A valve for controlling the flow of a fluid, which includes

a tubular member having a main inlet opening at one end connectable to a suction hose, an outlet opening at its other end which is connectable to a suction source, an auxiliary opening intermediate its ends, and a communication opening also intermediate its ends;

a sleeve member located about the tubular member to be slidable therealong and positioned on one side of the communication opening and having fast therewith a closure element located in the auxiliary opening and being of a suitable size relative to the opening to be slidable therein such that the sleeve member and closure element are displaceable between a normal operative configuration in which a restricted aperture is provided and an open con-



figuration in which a larger, substantially unrestricted aperture is provided;

a variable chamber defining means engaged with the sleeve member, and with the tubular member at a position on the other side of the communication opening to the sleeve member, to define an annular chamber about the tubular member that is in suction communication with the interior of the tubular member via the communication opening; and

a bias means for biassing the sleeve into a position in which the auxiliary opening is substantially closed.

4,570,661

HYDRAULIC FLUID SUPPLY SYSTEMS

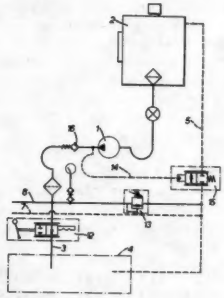
Neale A. Chaplin, Brackla, Great Britain, assignor to Powell Duffryn Engineering Limited, Pontyclun, England

Filed Feb. 13, 1985, Ser. No. 701,201

Claims priority, application United Kingdom, Feb. 28, 1984, 8405177

Int. Cl.[4] F15B *13/09*

U.S. Cl. 137—115 **5 Claims**



1. A hydraulic fluid supply system for supplying main flow and return supply lines and auxiliary flow and return supply lines, and comprising a reservoir, a pump for pumping fluid from the reservoir, a check valve downstream of the pump and a change over valve operable as required to allow flow through the main supply lines or only through the auxiliary supply lines, a dump valve in the return line to the reservoir which is arranged to open that return line when the pressure at the pump outlet exceeds a predetermined level, and pressure

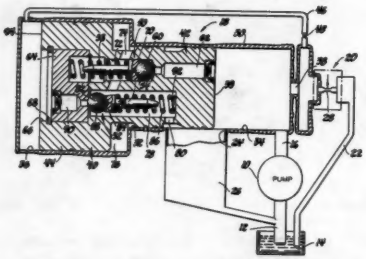
relief means for connecting the flow lines of both the main and auxiliary supply lines to the main return line upstream of the dump valve.

4,570,662

DEMAND RESPONSIVE FLOW CONTROL VALVE

Stanley E. Anderson, Saginaw, and Leonard N. Franklin, Jr., Reese, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 9, 1984, Ser. No. 598,481
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—117 **3 Claims**



1. A demand responsive flow controlling valve mechanism for use in a hydraulic fluid pump system having a flow regulating orifice and a demand regulated orifice, said valve mechanism comprising a slidable valve member with a first pressure responsive area subjected to pump pressure upstream of both orifices, a second and larger pressure responsive area subjected to system pressure downstream of said flow regulating orifice and upstream of said demand regulated orifice, a third pressure responsive area equal in size to the difference of said first and second pressure responsive areas, first regulator valve means for connecting said third pressure responsive area to said pump discharge pressure when said pump discharge pressure reaches a predetermined value and for permitting communication of said third pressure responsive area to exhaust when said pump discharge pressure is below said predetermined value, second regulator valve means for limiting the pressure operable on said second pressure responsive area at a higher pump discharge pressure, and a bypass port controlled by said slidable valve member, said valve mechanism being responsive to the pressure forces acting in opposition on said first and second pressure responsive areas to open said bypass port for the bypassing of excess pump discharge as determined by said flow regulating orifice when said demand regulated orifice is fully opened, said valve mechanism reducing the bypass port opening as pressure demand increases with a closing of said demand regulated orifice, said valve mechansim being substantially pressure balanced at said first predetermined pressure value, and said valve mechanism opening for bypassing of substantially all of the pump discharge when the higher pump discharge pressure is reached.

4,570,663

DISTRIBUTION VALVE WITH DUAL CAMS TO PREVENT UNCONTROLLED EXCURSIONS OF VALVE BALLS

Charles M. Gould, Glendale, and Andy F. Blake, Phoenix, both of Ariz., assignors to Shasta Industries, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 487,758, Apr. 22, 1983, Pat. No. 4,523,606. This application May 14, 1985, Ser. No. 734,394
Int. Cl.[4] F16K *31/16*
U.S. Cl. 137—119 **11 Claims**

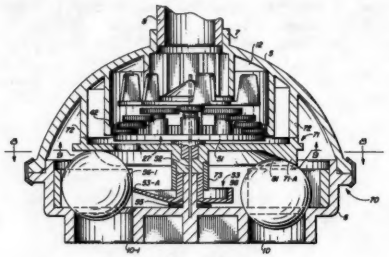
1. A fluid distribution apparatus having an inlet port for receiving fluid under pressure and also having a plurality of outlet ports through which the received fluid is sequentially expelled under pressure, said fluid distribution apparatus comprising in combination:

(a) a housing having said inlet port and said plurality of outlet ports therein, said housing bounding an interior chamber, said inlet port directing flow of said fluid downward into said chamber;

(b) a rotary impeller disposed beneath said inlet port in said chamber, said impeller having a first gear attached rigidly thereto;

(c) a planetary gear attached in stationary relationship to said housing in the interior thereof;

(d) gear reduction means having a second gear for meshing with said first gear and a third gear responsive to rotation of said second gear in geared-down relationship thereto for meshing with said planetary gear, said gear reduction means including a rotary base for supporting said second and third gears, said rotary base rotating in geared-down



relationship to said impeller in response to rotation of said impeller;

(e) a plurality of spherical valve balls each usually seated in a corresponding circular seating surface located at a respective one of said outlet ports to close that outlet port;

(f) first cam means, rigidly attached in fixed relationship to said rotary base and rotating in response to rotation of said impeller in geared-down relationship to said impeller, for sequentially unseating respective ones of said valve balls to allow fluid to be ejected from said chamber through unseated outlet ports; and

(g) second cam means, rigidly attached in fixed relationship to said rotary base and rotating in fixed relationship with said first cam means, for maintaining all of said valve balls except those presently unseated by said first cam means in their seated positions to prevent fluid momentum reversals of fluid with closed said outlet ports from unseating the ones of said valve balls seated on said closed outlet ports.

4,570,664

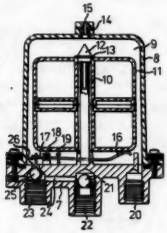
VENTING DEVICE FOR OIL-BURNING INSTALLATIONS

Nils I. Jonsson, Furulund, and Lars E. Hedenstierna, Lund, both of Sweden, assignors to EMA Instrument AB, Malmo, Sweden

Filed Dec. 14, 1984, Ser. No. 681,901
Claims priority, application Sweden, Dec. 15, 1983, 8306747
Int. Cl.[4] F04B *41/00*
U.S. Cl. 137—202 **4 Claims**

1. A venting device for oil-burning installations of the type comprising an oil supply pipe from an oil tank, a pump and a burner, a return pipe being arranged between the pump and the burner for feeding part of the oil back to the suction side of the pump, said venting device being mounted in said return pipe

and having a venting chamber with a float-controlled vent orifice, characterised in that the float controlling the vent



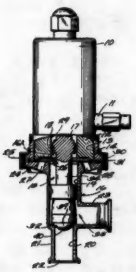
orifice also controls a bottom valve provided in the venting chamber.

4,570,665

ASEPTIC VALVE WITH UNITARY VALVE SEAT AND LIP SEALS

Robert D. Zimmerly, Kenosha, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Dec. 10, 1984, Ser. No. 680,094
Int. Cl.[4] B08B *3/00*; F16J *15/32*
U.S. Cl. 137—240 **9 Claims**



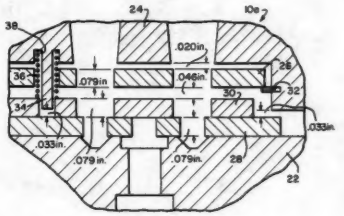
1. A valve comprising a body having wall means defining an inlet and an outlet and a circular seat defining an opening interposed between said inlet and outlet, said body having a first bore arranged coaxially with said opening and having an end surface, an actuator bonnet having an end surface and means for coupling said bonnet to said body with said end surfaces in abutting and sealing relationship and said bonnet having a second bore coaxial with the first bore, a stem coaxial with and axially reciprocable in said bores, said stem being slidably sealable within said second bore, and valve plug means attached to said stem said valve plug means including unitary sealing means at the distal end for reciprocating into and out of engagement with said seat and for controlling product flow between said inlet and outlet and further including upper and lower lip seals for sealing said first bore and steam passage means for conducting steam into and out of said first and second bores between said plug means and bonnet for pressurizing said first and second bores and said upper sealing lip against said first bore and said product flow pressurizing said lower sealing lip against first bore when said plug means is in an open position to prevent any of the product flow from migrating beyond said sealing lips and into said first and second bores.

4,570,666

UNIDIRECTIONAL, FLUID CONTROL VALVE

Kevin Hartshorn, Plainsboro, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 12, 1984, Ser. No. 588,647
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—512.1 **6 Claims**



1. A unidirectional, fluid control valve, comprising:

first means defining a valve seat having fluid ports formed therein;

second means, coupled to said valve seat, defining a ported, valving element stop;

third means, movably disposed between said seat and said stop, defining a plurality of ported, valving elements for engaging said seat to occlude said ports in said seat, and for lift thereof from said seat to expose said ports in said seat, thereby to prohibit, and to permit, fluid flow through said ports in said seat, respectively; and

fourth means, interposed between said third means and said second means, defining a ported, valving element buffer plate; wherein

said seat and said stop have mutually confronting surfaces; and further including

retaining means, coupled to one of said first and second means, for supporting said buffer plate within said valve in a non-contacting, spaced-apart disposition relative to said seat, said stop, and said valving elements, and further in a loose, independent and unrestrained disposition, relative to said stop, whereby said buffer plate is freely engageable with said stop; wherein

said confronting surfaces are spaced apart a first, fixed dimension;

said valving elements and said buffer plate are spaced apart a given distance therebetween, but together occupy a given portion of said first, fixed dimension; and

that which (a) remains of said first, fixed dimension, and (b) is devoid of said valving elements and said buffer plate, defines free space within said control valve in which to accommodate valving element lift from said seat towards said stop; wherein

said free space defines a total, valve lift-accommodating dimension, then, which is said first, fixed dimension less said given portion which is occupied, as aforesaid, by said valving elements and said buffer plate; and

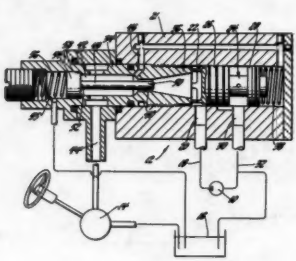
one of said first and second means has means for restricting lift of one of said valving element, toward said stop, to (a) a fraction of said lift-accommodating dimension, (b) a lift in which, as a consequence thereof, the flow coefficient of fluid permitted to flow through said ports in said seat diminishes only at a substantially linear rate, and (c) a lift which permits movement of said one valving element, toward said buffer plate, only a specified distance which is less than said given distance.

4,570,667

DEMAND RESPONSIVE FLOW REGULATOR VALVE

Michael T. Masica; Albert C. Wong, both of Saginaw, and John F. Yonker, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 17, 1984, Ser. No. 651,228
Int. Cl.[4] F04B *49/08*
U.S. Cl. 137—117 2 Claims



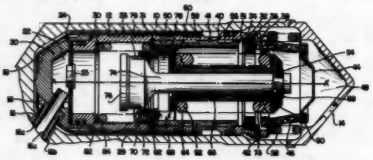
1. A flow regulator valve for use with a power steering pump and steering mechanism comprising; housing means; valve spool means slidably disposed in said housing means for bypassing excess pump flow; flow control orifice means for establishing a pressure signal proportional to pump flow to the steering mechanism, said pressure signal being operative on said valve spool means to control the bypassing of excess pump flow; and metering rod means for increasing the size of said orifice means when pressure demand at the steering mechanism increases including, rod means disposed in said orifice means, resilient means urging said rod means into said orifice means, and pressure responsive means subject to the pressure in the steering system for urging said rod means to move out of said orifice means whereby an increase in steering system pressure results in an increased fluid flow through said orifice means to said steering system, said metering rod means being mounted in said flow control orifice means for operation and movement independent of said valve spool means.

4,570,668

FLOW DIVIDING VALVE

Thomas A. Burke, Mentor, and Curtis H. Scheuerman, Newbury, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 16, 1984, Ser. No. 571,231
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—512.2 6 Claims



1. A flow dividing valve comprising:

a valve body having an input port, a primary flow output chamber, and a secondary flow output chamber;

an outer sleeve maintained within said valve body and cooperating with the valve body to provide a primary flow passage that is in communication with the primary flow output chamber, said outer sleeve including a primary flow valve seat;

an inner sleeve that is slidably maintained within said outer sleeve, said inner sleeve including a secondary flow valve seat and being movable between a first position where said inner sleeve is seated against the primary flow valve seat of said outer sleeve and a second position where a gap is provided between said inner sleeve and the primary flow valve seat;

first means for loading said inner sleeve against the primary flow valve seat of said outer sleeve;

a valve spool that is slidably maintained in said inner valve sleeve, said valve spool being movable between a first position where said valve spool is seated against the secondary flow valve seat of said inner sleeve, and a second position where maximum clearance is provided between said valve spool and the secondary valve seat; and

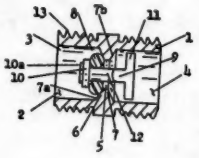
second means for loading said valve spool against the secondary flow valve seat of said inner sleeve.

4,570,669

SIMPLIFIED SPRINGLESS CHECK VALVE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Continuation-in-part of Ser. No. 410,870, Aug. 24, 1982, Pat. No. 4,501,289. This application Nov. 26, 1984, Ser. No. 674,963
Int. Cl.[4] F16K *15/00*
U.S. Cl. 137—528 12 Claims



1. A simplified two component springless check valve comprising:

an elongated valve housing with a bore passing therethrough between a first and a second valve housing ends and provided with two opposing centrally divided interconnecting larger diameter bore-end-sections of equidistant length from said first and second housing ends towards a central wall provided with a coaxial reduced diameter interconnecting short bore portion in communication with said end sections for fluid flow therethrough when said valve is connected into a line of fluid under pressure by said first and second valve housing ends comprising fluid supply and exhaust port means respectively subject to directional flow control,

a short, slightly elongated, axially movable pin inside said central bore portion having a shank of a diameter considerably smaller than the diameter of said central bore terminates at a first end thereof with a short round head of considerably larger diameter than said shank but smaller than the diameter of said central bore in order to pass therethrough during the initial assembly of the valve, while a second end thereof of tee configuration is flattened and provided with a tee of a size considerably larger than the diameter of said central bore in order not to pass therethrough during valve operation but smaller than the diameter of said bore-end-sections to facilitate free pin movement axially therein when subjected to pressure of fluid passing said tee unobstructed,

means for mounting said pin into the center of said bore via said central wall through a second larger diameter bore-end-section so as to secure said pin inside thereof when said pin head extends into a first larger diameter bore-end-section by a seal of a diameter larger than the diameter of said central bore for securing permanently said seal over said shank after passing said pin head adjacent a first side of said wall inside said first bore-end-section while said tee of said pin remains inside said second larger diameter bore-end-section adjacent a second side of said wall so as to permit fluid flow freely into a first direction initiating

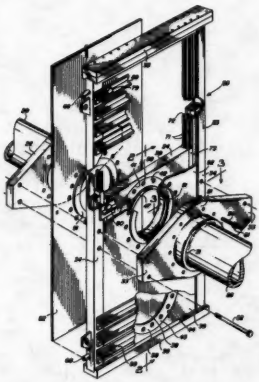
with said second larger diameter bore-end-section and continuing into said first larger diameter bore-end-section via said central bore for exhaust therefrom until the direction of fluid flow is changed into an opposite second direction whereby fluid pressure urges pin movement so as to render valve bubble-tight shut when said seal is forced against said first side of said wall axially by said fluid pressure, and vice-versa, means for holding said pin by said seal in said valve housing physically when said seal is placed over said shank during valve assembly.

4,570,670

VALVE

Charles D. Johnson, c/o Aramco, P.O. Box 1893, Ras Tanura, Dhahran, Saudi Arabia

Filed May 21, 1984, Ser. No. 612,348
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—553 **16 Claims**



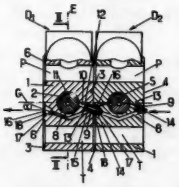
1. A gate valve comprising inlet and outlet body portions having aligned passageways therein, at least one of said body portions having a seat surrounding its passageway, gate means movable between said body portions transversely of said passageways between open and closed positions, said gate means having a sealing ring carried thereon, and a plurality of bolts extending through said one body portion and threadably received in said sealing ring for moving said sealing ring into sealing relationship with said seat, said bolts being retractable from engagement with said sealing ring to permit movement of said gate means.

4,570,671

FLUID DISTRIBUTORS

Krikor Constantinian, Bron, France, assignor to Rexroth Sigma, Venissieux, France

Filed Jan. 26, 1984, Ser. No. 574,032
Claims priority, application France, Jan. 27, 1983, 83 01248
Int. Cl.[4] F15B *13/08*
U.S. Cl. 137—596 **8 Claims**



1. A pressurized fluid distributor, such as a hydraulic fluid distributor, intended to be stacked against other similar distributors to form a stack, comprising:

a distributor body in which a slide-way valve may slide, said distributor body comprising

(a) an upstream and a downstream face parallel to one another, said faces serving as bearing surfaces in the stack,

(b) a transverse channel extending from said upstream face to said downstream face;

a working pressure in said distributor body;

an upstream pressure from an upstream distributor body;

complementary portions to which said transverse channel is connected of a pressure selector means formed when the distributor is in the stack for transmitting to said transverse channel the highest of said working pressure and said upstream pressure, said complementary portions of the pressure selector means comprising

(a) an elongate upstream housing formed in said upstream face, said upstream housing being connected laterally to said transverse channel,

(b) a duct connecting said upstream housing to said working pressure, said duct having an opening into said upstream housing forming a seat for a closure member,

(c) an elongate downstream housing formed in said downstream face at a position opposite said upstream housing in said upstream face, said downstream housing communicating with said transverse channel at the end of said transverse channel and forming a seat for another closure member,

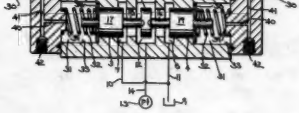
such that in a stack of said fluid distributors said upstream housing of a downstream distributor comes opposite and into communication with said downstream housing of an adjacent upstream distributor at a junction, the junction of these said housings forming a chamber imprisoning a closure member therein which acts as said pressure selector means.

4,570,672

HYDRAULIC CONTROL VALVE WITH INDEPENDENTLY OPERABLE BYPASS VALVE

Raud A. Wilke, Brookfield, Wis., assignor to Koehring Company, Brookfield, Wis.

Continuation-in-part of Ser. No. 503,910, Jun. 13, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 720,086
Int. Cl.[4] F15B *11/08*; F16K *11/10*
U.S. Cl. 137—596.13 **6 Claims**



1. Hydraulic control valve means of the type having an inlet to receive pressure fluid from a source, source fluid receiving means in communication with the inlet, and a function control valve element movable to and from an operative position at which it establishes communication between said fluid receiving means and a work port, characterized by:

means providing a bypass passageway connected with said inlet and through which pressure fluid from the source can bypass said fluid receiving means to thereby prevent pressurization thereof,

a bypass control valve element intersecting said passageway and which must be moved from a bypass open position, at

which it causes source fluid to bypass said receiving means, to an operative bypass closing position before source fluid can flow to said fluid receiving means to effect pressurization thereof,

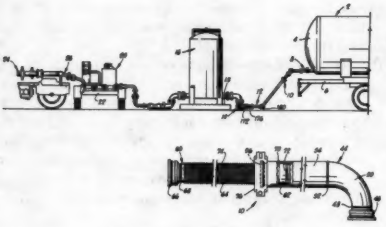
and first biasing means acting on said bypass control valve element to normally yieldingly hold the same in its bypass open position at which the function control valve element is ineffective.

4,570,673

FLUID FLOW DELIVERY SYSTEM

William D. Kendrick, and Terry D. Mayfield, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 1, 1984, Ser. No. 656,619
Int. Cl.[4] E21B *43/24*
U.S. Cl. 137—615 **5 Claims**



1. A rigid, articulated system for delivering liquid carbon dioxide, or the like, to a well from a fluid source located at the well site, said fluid source including a plurality of carbon dioxide storage tanks located at said well site, each of said storage tanks having an outlet therefrom located at a respective height above the ground at said well site, said system comprising:

a pump for pumping the liquid carbon dioxide from said fluid source to said well;

a rigid gathering manifold having a plurality of parallel inlets thereto and an outlet therefrom, said rigid gathering manifold being disposed at a height which is below the respective heights of said outlets of said storage tanks of said fluid source;

a rigid adjustable length means having a variable length for adjustably connecting an outlet of the outlets of said storage tanks of said fluid source in parallel with an inlet of the plurality of parallel inlets of said gathering manifold before pumping the liquid carbon dioxide into said well to accommodate for different distances and orientations between the outlet of said fluid source and the plurality of parallel inlets of said gathering manifold and provide parallel static coupling during the flow of the liquid carbon dioxide and having a rigid side wall means for maintaining a rigid linkage between the outlets of said storage tanks of said fluid source and the parallel inlets of said gathering manifold when the carbon dioxide is being pumped into said well, said rigid adjustable length means including:

a first rigid pipe having an inner diameter, a first end and a second end, said first end connectable to an outlet of a selected carbon dioxide storage tank of said plurality of storage tanks of said fluid source;

a second rigid pipe having an outer diameter less than said inner diameter, a first end disposed within said second end of said first rigid pipe, and a second end, said second rigid pipe further having a thread defined on the outer surface thereof;

a collar, connected to said first rigid pipe, having an inner surface with a thread defined thereon for receiving said thread of said second rigid pipe and adapted to clampingly engage said thread of said second rigid pipe; and

rigid conduit means for connecting said second end of said second rigid pipe to an inlet of the plurality of parallel inlets of said gathering manifold; and

connector means for connecting said gathering manifold with said pump and for allowing dynamic coupling between said gathering manifold and said pump during the flow of the liquid carbon dioxide, said connector means including:

a separator unit connected to the outlet of said gathering manifold;

a pressure booster unit connected to said separator unit;

a distribution manifold connected to said pressure booster unit; and

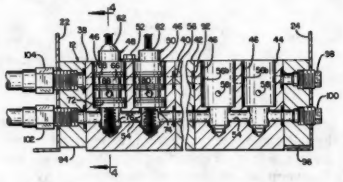
dynamic coupling means for providing a movable rigid-walled coupling between said distribution manifold and said pump to accommodate the motion of said pump when said pump pumps the carbon dioxide from said storage tanks to said well.

4,570,674

MECHANICALLY PROGRAMMABLE-SEQUENCING VALVE

Peter D. Kaye, Monroe, Oreg., assignor to Bell Industries, Inc., Eugene, Oreg.

Filed Feb. 23, 1984, Ser. No. 582,951
Int. Cl.[4] F15B *21/02*
U.S. Cl. 137—624.18 **6 Claims**



1. A programmable sequencing valve assembly for controlling fluid flow to a remote device, comprising

an elongate cam shaft,

a series of cams mounted on and disposed at intervals along the length of the shaft,

an elongate valve housing disposed with a major axis substantially parallel to, and located to one side of, said cam shaft, said housing including a series of housing modules disposed side-by-side and said modules being sealably joined one to another, each housing module including a first fluid passage segment and a second fluid passage segment extending therethrough, the first fluid passage segments of the various modules connecting with each other to form one manifold and the second fluid passage segments of the various modules connecting with each other to form another manifold, each housing module further having an actuator passage,

an array of rocker arms with one rocker arm for each cam, mounted with one set of ends in position to be actuated by the cams and another set of ends disposed along said housing,

at least one valve insert mounted in each housing module and the inserts of the housing modules having means coacting with said rocker arms actuating the valve inserts, each valve insert controlling flow between the manifolds and the actuator passage,

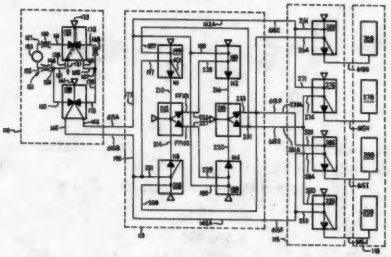
said rocker arms being exteriorly disposed on said housing, and

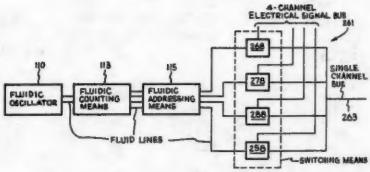
motor means for advancing said cam shaft.

4,570,675
PNEUMATIC SIGNAL MULTIPLEXER

Danny L. Fenwick, Springdale, and Charles M. Stanforth, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 22, 1982, Ser. No. 443,825
Int. Cl.[4] F15C *4/00, 1/08;* H01H *35/24, 35/40*
U.S. Cl. 137—805 **4 Claims**





1. A signal multiplexer, comprising:

(a) fluidic oscillator means for generating a sequence comprising the occurrence of fluidic oscillator signals and the absence of these signals;

(b) fluidic counter means coupled to the fluidic oscillator means for generating a fluidic switching signal at each of a selected plurality of fluid conduits in response to the occurrence of fluidic oscillator signals and in a predetermined sequence;

(c) a plurality of fluidically activated electrical switches fluidically connected to respective ones of the fluid conduits of (b) and electrically connected between respective input conductors and an output conductor for connecting each respective input conductor with the output conductor in response to the fluidic switching signals of (b), some of the switches including

(i) a conductor having a portion fastened to a housing and a portion movable with respect to the fastened portion;

(ii) a plurality of terminals fastened to the housing; and

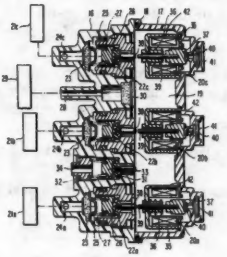
(iii) a passage adjacent to the conductor for applying fluid pressure to force the movable portion into contact with at least one of the terminals.

4,570,676
LUMBAR SUPPORT AIR VALVE ASSEMBLY

Shigeru Nishio, Kariya, and Nobuyuki Hashimoto, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 18, 1983, Ser. No. 476,756
Claims priority, application Japan, Mar. 18, 1982, 57-43367
Int. Cl.[4] F16K *11/14*
U.S. Cl. 137—870 **2 Claims**

1. A lumbar support air valve assembly comprising a housing having an inlet port adapted to be connected to a source of pressurized air and a plurality of outlet ports each of which is adapted to be disposed in fluid communication with a respective air bag positioned in the lumbar region of a seat back, a plurality of check valves, corresponding in number to the number of outlet ports, are positioned between said inlet port and said outlet ports so as to allow the transmission of air under pressure from said source of air to the respective air bags, and a plurality of solenoid actuators equal in number to said check valves being positioned within said housing adjacent a corresponding check valve with each of said solenoid actuators having a plunger movable in response to the application of electric current which is adapted to cause the associated check valve to move to its open position wherein each check valve is

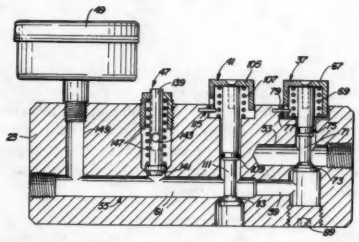


provided with a push rod and each plunger has a push rod connected to one end thereof for engaging the check valve push rod to move said check valve to the open position upon movement of said plunger towards said check valve and further comprising a plurality of exhaust ports each having a filter in said housing adjacent each solenoid actuator for communicating the interior of said housing with the atmosphere and a valve member located on the opposite end of each of said plungers for controlling the flow of pressurized air through the respective exhaust port.

4,570,677
UNITARY MULTIPLE CONTROL VALVE ASSEMBLY

George F. Roxton, Wheeling, and Howard Leibovitz, Chicago, both of Ill., assignors to Paratech Incorporated, Frankfort, Ill.

Filed Mar. 31, 1983, Ser. No. 481,048
Int. Cl.[4] F16K *17/04*
U.S. Cl. 137—881 **5 Claims**



1. A unitary dual control valve assembly providing for independent control of compressed air flow to a pair of inflatable air bags from a source of compressed air comprising:

a solid manifold;

a source channel formed in said solid manifold to convey compressed air from the source;

a pair of outlet channels formed in said manifold to selectively convey compressed air from the source to the inflatable air bags;

a first manually actuatable push button source valve to selectively connect said source channel to a first one of said outlet channels;

a second manually actuatable push button source valve to

selectively connect said source channel to a second one of said outlet channels;

a first manually actuatable push button discharge valve connected to said first outlet channel to permit compressed air in the associated inflatable air bag to be discharged;

a second manually actuatable push button discharge valve connected to said second outlet channel to permit compressed air and the associated inflatable air bag to be discharged;

a first safety relief valve connected to said first outlet channel, said first discharge valve constructed to serve as a back-up relief valve if said first safety relief valve should fail;

a second safety relief valve connected to said second outlet channel, said second discharge valve constructed to serve as a back-up relief valve if said second safety relief valve should fail;

a first pressure gauge connected to said first outlet channel; and

a second pressure gauge connected to said second outlet channel.

4,570,678

CONDUIT SYSTEM FOR TRANSPORTING LOW TEMPERATURE FLUIDS

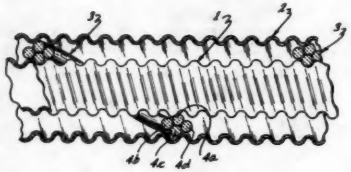
Gerhard Ziemek, Langenhagen, and Klausdieter Schippl, Hannover, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hannover, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,166

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1983, 3314884

Int. Cl.⁴ F16L *09/18*; H01B *07/22*

U.S. Cl. 138—113 **5 Claims**



1. Low temperature conduit system which includes a first inner metal tube and a second outer metal tube concentric to the first inner tube with an evacuated space in between the tubes, a spacer for holding the inner tube concentric to and in the outer tube being comprised of a helical assembly of a large plurality of ceramic filaments or fibers which are intertwined, stranded and/or braided together.

4,570,679

CONDUCTION OF LOW TEMPERATURE FLUID

Klaus Schippl, Hanover, Fed. Rep. of Germany, assignor to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 26, 1984, Ser. No. 655,084

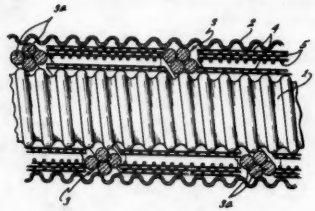
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334770

Int. Cl.⁴ F16L *9/10*

U.S. Cl. 138—149 **6 Claims**

1. A conduit system for the conduction of low temperature, e.g., cryogenic fluids being comprised of at least two concentrically arranged corrugated metal tubes spaced apart in thermally insulated fashion, the space between the two metal tubes being evacuated, the insulation comprising:

a spacer helically wrapped around the inner tube for supporting the outer one of the two tubes; and



a super insulation including a plurality of spaced apart metal foils with ceramic mesh or webbing material placed in between the respective two adjacent metal foils.

4,570,680

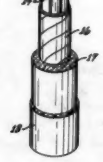
CONDUCTION OF A CHEMICALLY AGGRESSIVE FLUID

Satya P. Ratti, Bad Iburg, Fed. Rep. of Germany, assignor to Tabel- und Metallwerke Gutehoffnungshuette, Hanover, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 180,445

Int. Cl.⁴ F16L *9/14*

U.S. Cl. 138—149 **9 Claims**



1. A conduit for the conduction of a chemically aggressive fluid, comprising:

a tube made of a nonmetallic, synthetic material which resists chemical aggression;

a protective layer on the tube being made of lead and provided for impeding diffusion of the fluid beyond the tube; and

heat insulation means surrounding said layer.

4,570,681

APPARATUS FOR STOPPING WEAVING MACHINE AT PREDETERMINED POSITION

Yoshimi Wada, Higashiyamato, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Oct. 11, 1983, Ser. No. 540,665

Claims priority, application Japan, Oct. 12, 1982, 57-177534

Int. Cl.⁴ D03D *51/02*

U.S. Cl. 139—1 E **8 Claims**

1. A weaving system comprising:

(A) a weaving mechanism which comprises

(a) a main mechanism having a main shaft, said main mechanism being arranged to move cyclicly in synchronism with the rotation of said main shaft,

(b) main driving means capable of being connected with said main mechanism for driving said main mechanism at a normal speed,

(c) secondary driving means capable of being connected

with said main mechanism for driving said main mechanism at a slow speed slower than said normal speed,

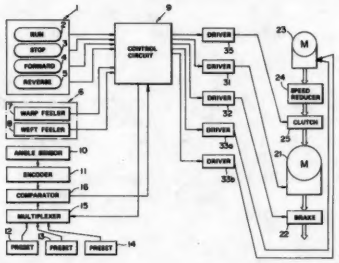
(d) braking means capable of stopping the movement of said main mechanism,

said weaving mechanism being capable of being in a normal operation mode in which said main driving means is connected with said main mechanism and actuated to drive said main mechanism at said normal speed, a first slow operating mode in which said secondary driving means is connected with said main mechanism and actuated to drive said main mechanism at said slow speed, and a braking mode in which said braking means is actuated to stop the movement of said main mechanism,

(B) actuating means, connected with said main driving means, said secondary driving means and said braking means, for changing the operating mode of said weaving mechanism,

(C) means for producing a stop signal,

(D) angle sensing means for sending an angular position of said main shaft with respect to a reference angular position,



(E) means for supplying a preset angle,

(F) means, connected with said angle sensing means and said preset angle supplying means, for comparing the angle sensed by said angle sensing means with the preset angle of said preset angle supplying means, said comparing means producing a position signal when the sensed angle becomes equal to the preset angle, and

(G) control means, connected with said stop signal producing means and said comparing means so as to receive said stop signal and said position signal, and further connected with said actuating means, for changing the operating state of said weaving mechanism by commanding said actuating means to immediately stop said main mechanism from said normal speed by putting said weaving mechanism in said braking mode upon receipt of said stop signal during said normal operation mode, said control means then deactivating said braking means and starting said weaving mechanism in said first slow operating mode, and upon receipt of said position signal from said comparing means, stopping the slow speed movement of said main mechanism by putting said weaving mechanism again in said braking mode.

4,570,682

SYSTEM FOR CONDITIONING TEXTILE MATERIAL IN A WEAVING MACHINE

Urs Bachmann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 19, 1984, Ser. No. 632,238

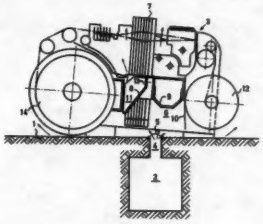
Claims priority, application Switzerland, Aug. 30, 1983, 4749/83

Int. Cl.[4] D03J *1/02*

U.S. Cl. 139—1 C **9 Claims**

1. A system for conditioning textile material in a weaving machine having a plurality of heddles and a cloth beam, said system including

a feed duct extending under a weaving machine and having an



air outlet extending towards a space between the heddles and cloth beam, and

a covering over said air outlet having a plurality of fine outlet openings therein.

4,570,683

YARN HOLDING DEVICE

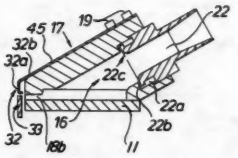
John D. Griffith, Tyne and Wear, England, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 530,688, Sep. 9, 1983, abandoned. This application May 21, 1985, Ser. No. 736,553

Claims priority, application United Kingdom, Jan. 16, 1982, 8201211

Int. Cl.[4] D03D *49/70*

U.S. Cl. 139—194 **5 Claims**

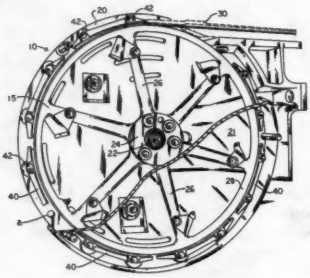


1. A weft yarn end holding device for a fluid loom comprising a stationary housing secured to the loom frame, a fluid channel located internally of the housing along which a fluid flow is directed to draw the weft yarn end into the channel, the channel having an elongate mouth extending in the direction of the warp sheet of the loom, the mouth having a yarn receiving portion for receiving the yarn end after the weft yarn has been shot across the warp sheet, clamp means located in fixed position adjacent the mouth and including a pair of jaws extending between said yarn receiving portion of the mouth and the fell of the loom, one of the jaws being resiliently deflectable and at least one of the jaws being movable to effect opening and closing of the clamp means, and means to actuate the clamp means to open the jaws to receive a yarn end as the weft yarn moves toward the fell and to subsequently close the jaws to yieldingly grip the yarn end so that, on continued movement of the weft yarn toward the fell, the yarn end is dragged along the mouth and the clamp means and is tensioned thereby.

4,570,684
TAPE RESTRAINING SHOE FOR SHUTTLELESS LOOMS

Rudolf F. Feigl, Burlington, N.C., assignor to Draper Corporation, Greensboro, N.C.

Filed Apr. 30, 1984, Ser. No. 605,235
Int. Cl.[4] D03D *47/00*
U.S. Cl. 139—449 **9 Claims**



1. A tape restraining shoe of the type used in shuttleless looms to guide and maintain the flexible inserting members as they are wrapped about and extended from the oscillating wheels by which they are driven, and wherein the oscillating wheels are mounted on an underlying stationary support plate; said restraining shoe comprising:

(a) a body having an upper yoke, and a sole portion which lies immediately above the flexible inserting member to maintain the inserting member on its oscillating track;

(b) a wear strip mounted on said sole portion adjacent said flexible inserting member;

(c) means for adjustably mounting said shoe such that the surface of said wear strip is a prescribed distance from the flexible inserting member; said means including:

(i) said upper yoke having a pair of spaced slots therethrough for receiving a fastener; said slots having an elongated shape wherein the axis of the elongation is substantially perpendicular to said sole portion;

(ii) said support plate including a plurality of apertures aligned with said slots when said shoe is positioned for mounting on said support plate; said apertures being of a size smaller than said slot;

(iii) a fastener means having an enlarged head for insertion through said slot and an underlying one of said support plate apertures to secure said shoe to the support plate;

whereby said enlarged fastener head overlaps the edges of said slot to bias said shoe against the support plate when said fastener is tightened into place.

4,570,685
VACUUM TUBE ENGINE OIL SAMPLER

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73128

Continuation-in-part of Ser. No. 636,787, Aug. 1, 1984, Pat. No. 4,524,811, which is a continuation-in-part of Ser. No. 438,240, Nov. 1, 1982, abandoned. This application Jun. 24, 1985, Ser. No. 747,624
Int. Cl.[4] B65D *51/16*
U.S. Cl. 141—61 **9 Claims**

5. A system for obtaining an oil sample from an engine crankcase, gearbox or oil conducting line having an opening in its wall, comprising:

an oil sample receiving container;

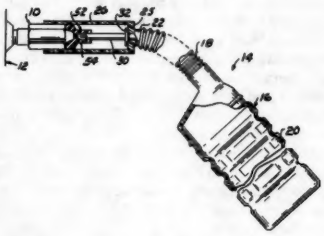
an elongated flexible tube connected at one end with said container;

a hollow member axially connected with the other end of said tube,

said hollow member having an elongated tubular portion adapted at its end opposite said tube for entering the opening in the crankcase, gearbox, or oil conducting line wall and admitting oil to the container,

said tubular portion having a wall,

said tubular portion having an opening in its wall adjacent its said opposite end;



means for reducing the pressure in said container to less than atmospheric pressure; and,

frangible stopper means normally forming a primary seal around the wall opening in said tubular portion for maintaining the reduced pressure in said container.

4,570,686
APPARATUS FOR PREVENTING BLOCKAGE OF VAPOR RECOVERY HOSE BY LIQUID FUEL

George T. Devine, Greensboro, N.C., assignor to Gilbarco Inc., Greensboro, N.C.

Filed Jun. 24, 1983, Ser. No. 507,488
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—286 **20 Claims**

12. In a gasoline dispensing system, the combination comprising:

a vapor recovery hose;

a product hose enclose within the length of the interior of said vapor recovery hose; and

wicking means within the space between the inside and outside walls of said vapor recovery and product hoses, respectively, for both absorbing liquid entrapped in said space, and substantially increasing the surface area of evaporation for the liquid, thereby substantially preventing blockage of a vapor recovery path formed by said space.

4,570,687
METHOD AND APPARATUS FOR PRODUCING LUMBER PRODUCTS WHICH ARE MACHINED ON ALL SIDES

Hans Dietz, Ammerbuch-Pfaffingen, Fed. Rep. of Germany, assignor to Wurster u. Dietz GmbH u. Co. Maschinenfabrik, Tübingen-Derendingen, Fed. Rep. of Germany

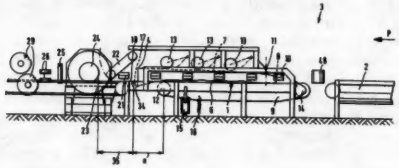
Filed Dec. 1, 1983, Ser. No. 557,351
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244393
Int. Cl.[4] B27C *1/08*
U.S. Cl. 144—378 **8 Claims**

1. A method of producing lumber products from a tree trunk in a processing line of a machining station of a sawmill installation with which the lumber products are machined on all sides, and the trunk has a small end as well as a thicker large end as

the trunk increases in thickness from the small end to the thicker large end; the trunk is also curved in the longitudinal direction thereof, and has a central longitudinal plane disposed in the direction of curvature; the trunk has two opposed longitudinal sides, and between them a surface portion which is concavely curved in the longitudinal direction of the trunk, and a surface portion which is convexly curved in the longitudinal direction of the trunk; said method comprising the steps of:

first aligning said central longitudinal plane of said trunk to be approximately parallel to the machining surfaces of two side cutting devices which are arranged across from one another on both sides of said processing line of said machining station; said machining surfaces of said side cutting devices being parallel to one another;

thereafter aligning the trunk in the vertical direction for equalization of strong curvature by lowering only said thicker trunk end so that the trunk ends of the convexly curved surface portion lie in a plane which lies at right angles to said machining surfaces and which lies approxi-



mately parallel to a machining plane of a machining tool for flattening of the trunk located in the transporting direction thereof before the lowered trunk end;

flattening said concavely curved surface portion of said trunk, by at least partially flattening only at said lowered thicker large end thereof in order to equalize the curvature thereof extensively when the trunk is aligned in vertical direction, said flattening occurring in a plane which is at right angles to said machining surfaces of said side cutting devices and approximately parallel to a plane which is tangential to said large and small trunk ends on said convexly curved surface portion;

then flattening said trunk on said two opposed longitudinal sides thereof with said side cutting devices over entire length of the trunk whereby a lower horizontal surface results to serve as a guide during further processing thereof; and

subsequently cutting off boards from said flattened longitudinal sides for realizing maximum production yield from the trunk.

4,570,688

SECURITY WALLET

George Williams, Greenville, N.C., assignor to Brigade Quartermasters, Ltd., Atlanta, Ga.

Filed Sep. 1, 1983, Ser. No. 529,022

Int. Cl.[4] A45C *1/06, 13/30*

U.S. Cl. 150—134 **13 Claims**

1. A foldable security wallet, comprising:

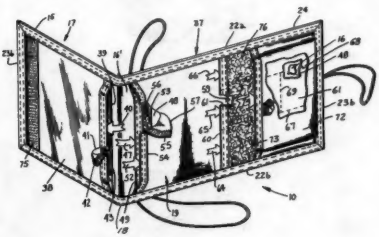
first flat panel means having a first side facing an outer side of the wallet and an inside surface facing an inner side of the wallet, and having a longitudinal dimension extending substantially the length of the wallet;

second flat panel means having peripheral edges overlying and peripherally secured to said inside surface of said first panel means to define a first article-receiving pocket;

said second panel means extending from one end of said first panel means to a terminal edge at an asymmetrical location along said longitudinal dimension and dividing the first panel means into a shorter portion and a longer portion, said terminal edge extending across the width of said first panel means and being unattached to said inside surface of said first panel means so as to form the mouth of said pocket, whereby the length of said first pocket is parallel to the longitudinal dimension of said first panel means;

means defining a fold region extending laterally across said first panel means adjacent said mouth of the pocket, the shorter portion of said first panel means being selectably foldable to overlay the longer portion of the first panel means and thus to overlay said terminal edge of said second panel means, so as to selectably close the mouth of said first pocket;

third flat panel means having peripheral edges overlying said second panel means to define a second pocket and extending in length susbstantially less than the longitudinal extent of the longer portion of said first panel means, so that the bottom end of the third panel means is spaced inwardly from said one end of the first panel means,



said third panel means having an unsecured terminal edge extending across the width of said first panel means to form the mouth of said second pocket;

said terminal edges of said second and third panel means being substantially in mutual alignment, so that the mouths of said first and second pockets are mutually contiguous;

fourth flat panel means having peripheral edges overlying said second panel means between the bottom end of said third panel means and said one end of the first panel means, so as to define a third pocket on said inner side of the wallet;

said fourth panel means having an unattached terminal edge extending across the width of said first panel means adjacent said bottom end of said third panel means to form the mouth of said third pocket; and

said peripheral edges of each panel means being secured to confronting peripheral edges of the adjacent panel means, whereby the security wallet presents a substantially smooth and flat configuration whether folded or unfolded.

4,570,689

BICYCLE TIRE TREAD

Susumu Kazusa; Harunori Okamoto, and Eiji Fukuchi, all of Kagawa, Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Mar. 20, 1984, Ser. No. 591,432

Claims priority, application Japan, Oct. 21, 1983, 58-163804[U]

Int. Cl.[4] B60C *11/06*

U.S. Cl. 152—209 R **21 Claims**

1. In a bicycle tire, an improved tread design comprising:

an annular bicycle tire carcass;

an annular, raised center rib extending concentrically about said carcass and being provided with outwardly opening, transversely disaligned scalene trapezoidal grooves in the right and left sides of said center rib whereby the center rib defines a zigzag shape with a continuously annular midportion, the lands between said grooves on both the right and left sides of said center rib defining parallel

annuli interrupted by said grooves and extending parallel to said annular midportion; and

raised blocks spaced from both sides of said center rib along the entire longitudinal periphery of said bicycle tire.

17. In a bicycle tire, an improved tread design comprising:

an annular bicycle tire carcass;

an annular, raised center rib extending concentrically about said carcass defining a continuous annular center portion, and opposite side portions each provided with transversely disaligned, outwardly opening grooves, each

groove having a bottom planar surface parallel to the circumferential extent of the rib, a first planar side surface extending perpendicularly to said circumferential extent of the rib, and an opposite, second planar side surface extending at an angle to the circumferential extent of the rib, the lands between said grooves on opposite side portions of said center rib defining parallel annuli interrupted by said grooves and extending parallel to said annular midportions; and

tread portions outwardly of said rib.

4,570,690

MIXING PROCEDURE FOR OBTAINING FILLED RUBBER VULCANIZATES CONTAINING AROMATIC FURAZAN OXIDES

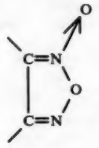
Daniel F. Graves, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 21, 1984, Ser. No. 653,652

Int. Cl.[4] C08C *4/00;* **C08K** *5/35, 3/04*

U.S. Cl. 152—564 **17 Claims**

1. A filler reinforced vulcanizate made by vulcanizing a composition comprising at least one rubber having an unsaturated carbon chain, reinforcing filler and a minor, cured property-improving amount of at least one aromatic furazan oxide of the partial formula:



wherein the depicted carbon atoms are part of a single aromatic ring, said composition prepared by mechanically compounding the rubber, filler and furazan at a temperature of at least about 280°–400° F. for at least about 2 minutes.

4,570,691

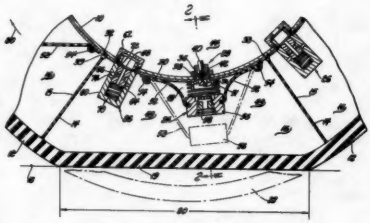
TIRE PRESSURE REGULATION SYSTEM

Donald G. Martus, 38235 Hazel Rd., Mt. Clemens, Mich. 48045

Filed May 3, 1984, Ser. No. 606,447

Int. Cl.[4] B60C *5/24, 5/20*

U.S. Cl. 152—332.1 **6 Claims**



1. In a wheel-pneumatic tire assembly intended for operation on soft or hard terrain in a range of vehicle speeds: the improvement comprising mechanism causing the tire to have a relatively large area footprint in a low vehicle speed range, and a relatively small area footprint in a high vehicle speed range;

said mechainsm comprising partition means (14) subdividing the tire into a series of separate pressurizable compartments occupying different contiguous locations around the tire circumference; wall means (52, 52*a*) arranged in each compartment for dividing same into a relatively large main chamber and a relatively small air-admission chamber (48);

a first air intake check valve between the atmosphere and each air admission chamber for admitting air into the admission chamber when the admission chamber pressure is below atmospheric pressure;

a second valve between each air admission chamber and each main chamber, each said second valve being responsive to centrifugal force and tire-terrain squeeze pressure for transferring air from the associated air-admission chamber to the associated main chamber when the vehicle is in a transition speed range between the low and high speed ranges;

and a third exhaust valve between each main chamber and atmosphere, each said third valve being responsive to centrifugal force for exhausting pressurized air out of the main chamber to the atmosphere only when the vehicle is at a specific speed range within the transition speed range.

4,570,692

METHODS OF POURING METAL

William G. Wilson, 820 Harden Dr., Pittsburgh, Pa. 15229

Filed Nov. 3, 1980, Ser. No. 203,315

Int. Cl.[4] B22D *27/00*

U.S. Cl. 164—56.1 **8 Claims**

1. The method of pouring molten metal into a receiving receptacle comprising the steps of:

(a) pouring the metal through a generally vertical consumable metal tube extending from a pouring source to a point submerged beneath the surface of a molten pool in the receptacle beginning adjacent the bottom of said receptacle,

(b) continuously consuming the end of said vertical tube submerged beneath the surface of the molten pool at a rate such as to maintain a generally uniform portion of tube end submerged in said molten pool as pouring progresses of sufficient length to provide a stirring action across substantially the full top area and to prevent the metal from flowing across the top surface as a flowing layer beginning adjacent the bottom and continuing until pouring is completed; and

(c) removing the unconsumed portion of said tube when pouring into the receptacle is completed.

4,570,693

METHOD OF SQUEEZE FORMING METAL ARTICLES

John Barlow, Willenhall, England, assignor to GKN Technology Limited, Wolverhampton, Great Britain

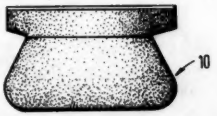
PCT No. PCT/GB84/00130, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/04264, PCT Pub. Date Nov. 8, 1984

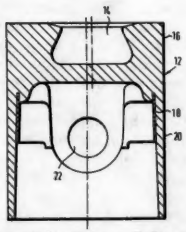
PCT Filed Apr. 18, 1984, Ser. No. 681,997

Claims priority, application United Kingdom, Apr. 26, 1983, 8311262; Apr. 26, 1983, 8311264

Int. Cl.[4] B22D *19/00*; B22C *1/08*

U.S. Cl. 164—112 13 Claims





1. A method of manufacturing a light metal article in a squeeze forming press by squeeze forming molten metal in a mould of the press wherein:

a core comprising a non-sintered soluble salt cure, defining a required shape in the squeeze formed article, produced solely by isostatic compaction of a fine grained salt mixture to such a density and surface finish that it retains its integrity under the conditions of sustained temperature and pressure transmitted thereto by the metal during the squeeze forming operation, is located in a first mould part of the press prior to the introduction of molten metal thereto;

molten metal is introduced into said first mould part;

the mould is closed under pressure by a second mould part of the press to displace the molten metal to fill a die cavity defined between said first and second mould parts and the metal is maintained under pressure whilst solidification thereof takes place; and

the mould is then opened, the squeeze formed metal article extracted and the core dissolved therefrom.

4,570,694

MOLD-BLOWING APPARATUS

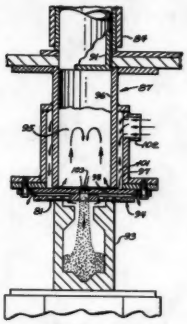
Robert S. Lund, 458 Elm St., Elmhurst, Ill. 60126

Continuation-in-part of Ser. No. 342,071, Jan. 25, 1982, Pat. No. 4,460,032. This application Apr. 12, 1984, Ser. No. 599,728

Int. Cl.[4] B22C *15/22*

U.S. Cl. 164—158 19 Claims

17. A mold-blowing apparatus for blowing sand into molds including a blow box means forming a sand receiving cavity and an exit at the bottom of the cavity and centrally located therein, a plunger movable into the cavity and through it approximately to the bottom of the cavity, and including an air supply means for fluidizing the sand and blowing it through the exit, said air supply means combining with said blow box to define an air path unobstructed by the movement of the plunger and being so constructed as to blow air, when the plunger is near the bottom, into cavity peripherally thereof to



scour surfaces leading to the exit for blowing sand clinging thereto through the exit.

4,570,695

THIN METAL BAND AND A METHOD FOR THE MANUFACTURE OF THE SAME

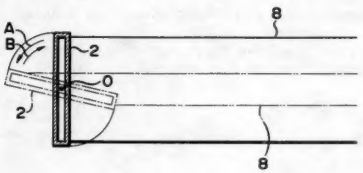
Takashi Ishii; Shinichi Murata, both of Tokyo; Shiro Kusagawa, Yokohama, and Miyoshi Wakasaki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 26, 1984, Ser. No. 593,303

Claims priority, application Japan, Mar. 31, 1983, 58-55931

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—463 32 Claims



7. A method for manufacturing a thin metal band, which method comprises the steps of continuously varying the width of the thin metal band, while manufacturing the thin metal band through the melt quenching of molten magnetic metal, said melt quenching being practiced by the steps of jetting said melt onto the outer surface of a rotating cooling roll from a rectangular nozzle opening, while at the same time adjusting the width of the thin metal band.

4,570,696

DESIGN OF BOTTOM BLOCKS FOR ELECTROMAGNETIC CASTING

John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 957,219, Nov. 2, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,192

Int. Cl.[4] B22D *27/02*

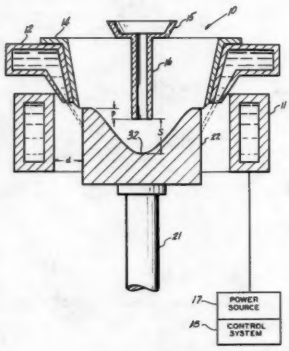
U.S. Cl. 164—467 4 Claims

1. In a system for electromagnetically casting a molten material having a specific electrical resistivity at a temperature close to the solidus temperature of said material comprising:

means for electromagnetically containing said material and for forming said molten material into a desired shape;

a bottom block for receiving and containing an initial surge of said molten material; and

a means for supplying said molten material to said bottom block and said electromagnetic containing means, the improvement wherein:



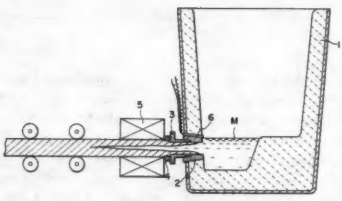
said bottom block is constructed of material having an electrical resistivity at ambient temperature which is approximately equal to said specific electrical resistivity of said material to be cast, whereby during start up, the containment conditions existing during steady state casting are approximated.

4,570,697

METHOD OF TREATING FINAL CONTINUOUS CAST STRAND IN A HORIZONTAL CONTINUOUS CASTING PROCESS

Takasuke Mori, Hyogo; Jun Miyazaki, Kobe, and Hitoshi Nakata, Osaka, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 18, 1984, Ser. No. 571,694
Claims priority, application Japan, Jan. 18, 1983, 58-7132
Int. Cl.⁴ B22D *11/16*
U.S. Cl. 164—484 **3 Claims**



1. A method of treating a final continuously cast strand in a horizontal continuous casting process utilizing a feed nozzle with a circular cross-section and a tundish including a tundish nozzle and having molten metal disposed within said tundish, which comprises:

discontinuing drawing of said strand when the level of molten metal within said tundish becomes lower than a prescribed level at a portion near an upper surface of said tundish during a final stage of horizontal casting;

redrawing said strand after a lapse of time t in accordance with the equation:

$$0.02D^2 < t < 0.1D^2$$

wherein t denotes time in minutes and D denotes an inner diameter dimension in cm of said feed nozzle; and

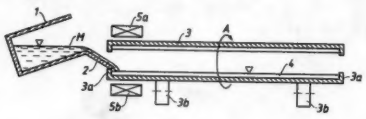
breaking said strand at said feed nozzle.

4,570,698

METHOD OF AND APPARATUS FOR CENTRIFUGAL CASTING

Sten Kollberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 17, 1984, Ser. No. 651,292
Claims priority, application Sweden, Sep. 21, 1983, 8305084
Int. Cl.⁴ B22D *27/02*
U.S. Cl. 164—498 **4 Claims**



1. A method for centrifugal casting by a rotating centrifugal casting mold, comprising projecting a traveling magnetic field into the front end of the mold, the field traveling tangentially with respect to the inside periphery of the mold and in the same direction and at substantially the same velocity as said periphery is rotating, and while said field is maintained pouring a melt into the front end of the mold, the melt from start to finish of the pouring being substantially immediately driven to the same velocity of the mold's inside periphery and forming a substantially uniform wall thickness until the melt fills-in the mold, said field being projected into the mold from its front end to not more than the longitudinal center of the mold.

3. A centrifugal casting apparatus comprising a rotative centrifugal casting mold made of non-magnetic metal and having a front end through which a melt is poured for casting, means for rotating the mold in one direction, and at least one electromagnetic stirrer means on the outside of the mold's front end only and extending to not more than the longitudinal center of the mold, and positioned to project a traveling magnetic field through the mold and tangentially into melt poured through the mold's front end at a speed substantially the same as the speed of the rotative mold and in said one direction.

4,570,699

MULTI-TURN COILS OF CONTROLLED PITCH FOR ELECTROMAGNETIC CASTING

Gerhart K. Gaule, Elberon, N.J.; John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 184,860, Sep. 8, 1980, abandoned, which is a continuation of Ser. No. 9,429, Feb. 5, 1979, abandoned. This application Jan. 7, 1985, Ser. No. 689,354
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.⁴ B22D *27/02*
U.S. Cl. 164—503 **11 Claims**

1. An electromagnetic casting system inductor adapted for electromagnetic casting of molten material into an ingot, comprising:

a multi-turn, variable pitch inductor having a least three individual turns arranged in stacked relationship with each turn being oriented parallel to each other such that the center line through the mid-point of each turn is substantially perendicular to the longitudinal axis of the inductor, said turns being electrically connected in series and being spaced apart by insulating spacers, and wherein the spacing between the inductor turns has a value $a_{(z)}$ defined substantially by the formula,

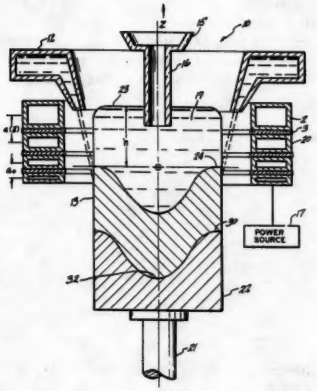
$$a(z) = a_o / \sqrt{\frac{h - z}{h}}$$

wherein

$a_{(z)}$=the pitch or spacing between inductor turns at a

height z above the solidification interface of said molten material

a_o=the pitch or spacing between inductor turns at the solidification interface of said molten material



h=the total molten material head

z=the height above the soldification interface.

4,570,700

FLAT, MULTI-LUMINAL TUBE FOR CROSS-FLOW-TYPE INDIRECT HEAT EXCHANGER, HAVING GREATER OUTER WALL THICKNESS TOWARDS SIDE EXTERNALLY SUBJECT TO CORROSIVE INLET GAS SUCH AS WET, SALTY AIR

Toshio Ohara; Sigenobu Fukumi, both of Kariya, and Yoshiyuki Yamauchi, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 13, 1983, Ser. No. 560,977

Claims priority, application Japan, Jan. 10, 1983, 58-2511

Int. Cl.[4] F28F *1/02*

U.S. Cl. 165—134.1 **20 Claims**

1. In a heat exchanger flat tube for use in a cross-flow indirect heat exchanger:

(a) in which a corrosive vapor to be cooled is passed externally, transversally of the flat tube, while a fluid capable of absorbing heat conducted through an outer peripheral sidewall of the tube extending perimetrically of the tube is circulated longitudinally of the tube through longitudinal passageway means of the tube,

(b) in which the tube is made of a metal having a relatively high heat conductivity, but one which is, over time, capable of being corrosively attacked by said vapor to such a degree as to eventually produce pinholes through said outer peripheral wall, at least at vapor inlet conditions to the heat exchanger,

(c) in which said outer peripheral wall of the tube is constructed and arranged to have two opposite relatively broad faces and two opposite narrow edges, and

(d) in which said tube is constructed and arranged to have one of said narrow edges be a leading edge thereof as respects said vapor inlet,

the improvement wherein:

said outer peripheral wall of said tube is substantially thicker over a portion thereof which includes all of said leading edge and respective adjoining parts of said opposite faces, than it is over the remainder thereof.

4,570,701

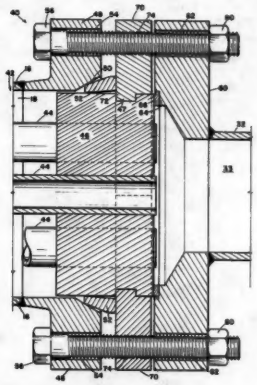
DUAL PURPOSE CLOSURE FOR HEAT EXCHANGERS

Wf Roberts, 4731 S. Columbia Pl., Tulsa, Okla. 74105

Filed Nov. 14, 1983, Ser. No. 551,573

Int. Cl.[4] F28F *9/26*

U.S. Cl. 165—158 **1 Claim**



1. An end closure for a heat exchanger of the type having a shell side enclosure and at least one tube within said shell, the closure comprising a shell flange attached to the end of said shell, a tube sheet encompassing said tube and situated within said shell adjacent said end, said tube sheet having a peripheral groove, a tubular connection and a tube flange for said tubular connection, said tube flange in facing alignment with said shell flange, a thrust flange positionable between said shell flange and said tube flange, said thrust flange surrounding said tube sheet and including inner peripheral lip for interconnection with said tube sheet groove, means to seal between said tube sheet and said shell side flange, and means to seal between said tube flange and said tube sheet, a plurality of axially aligned openings in said shell side, tube and thrust flanges, each opening to receive a threaded connection bolt or stud to assemble said closure, said aligned opening in said shell side flange and said tube flange being unthreaded and larger in diameter than said bolt, said aligned opening in said thrust flange being threaded to match said threaded bolt or stud, the head and nut for said bolt or stud being outside said shell side flange and said tube flange whereby rotation of said bolt in one direction will apply compressive force of said thrust flange to said means to seal between said tube sheet and said shell side flange.

4,570,702

SHELL AND TUBE VERTICAL HEAT EXCHANGER WITH SLEEVES AROUND THE TUBES

Donald C. Stafford, Hinsdale; Tushar K. Shah, Cresthill, and Vincent F. Allo, Warrenville, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 28, 1983, Ser. No. 479,698

Int. Cl.[4] F28D *7/00*

U.S. Cl. 165—159 **1 Claim**

1. A heat exchanger comprising:

a shell connected to vertically spaced apart horizontally arranged circular upper and lower tube sheets;

a plurality of vertically positioned parallel tubes, with each tube extending through and connected to a hole in each tube sheet;

a bottom sleeve-supporting plate positioned above, and spaced apart from, the lower tube sheet;

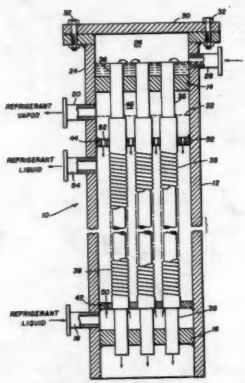
the bottom sleeve-supporting plate containing a hole which equalizes heat exchange liquid pressure on both sides of the plate;

a top sleeve-supporting plate positioned below, and spaced apart from, the upper tube sheet;

the top sleeve-supporting plate containing holes which permit heat exchange liquid to flow from above that plate into the space between the bottom and top sleeve-supporting plates;

a plurality of sleeves joined to holes in the top and bottom sleeve-supporting plates;

each sleeve having a corrugated wall to create turbulent flow of heat exchange fluid in the annular space between the sleeve and tube;



each of said tubes being axially positioned in a sleeve so as to provide an annular space between the tube outer surface and the sleeve inner surface so that a heat exchange liquid can flow into the sleeve bottom end and out the sleeve upper end;

means to feed a heat exchange liquid into a space between the bottom sleeve-supporting plate and the lower tube sheet;

means to withdraw heat exchange fluid from the shell side of the heat exchanger above the bottom sleeve-supporting plate and including means to withdraw heat exchange fluid from between the top sleeve-supporting plate and the upper tube sheet and means to withdraw heat exchange fluid from below the top sleeve-supporting plate; and

a liquid distribution box positioned above the upper tube sheet and means to deliver a feed liquid to the liquid distribution box.

4,570,703

TUBE SUPPORT GRID AND SPACER THEREFOR

Richard J. Ringsmuth, Solano Beach, and Jay S. Kaufman, Del Mar, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 8, 1982, Ser. No. 346,612
Int. Cl.[4] F28F *9/04*
U.S. Cl. 165—162 **12 Claims**

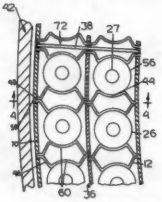
1. A tube support grid for supporting and spacing heat exchange tubes within a heat exchanger, said heat exchanger being characterized by expected temperature ranges according to location within said heat exchanger, each heat exchange tube having both a coolant inlet and a coolant outlet adjacent its base and being welded at the base to a tube sheet and extending generally upward therefrom, said heat exchanger having a predetermined location a predetermined distance above said tube sheet for said tube support grid, said tubes being arranged on a circular array with a predetermined number of circular rows, said bases of said tubes being arranged in a similar array, the radial and circumferential pitches of which vary within known limits according to the temperature of the tube sheet, said grid comprising:

a series of concentric rings;

means supporting said rings within said heat exchanger; and

a plurality of spacers, each spacer spacing an immediately adjacent pair of said rings, each spacer spacing immediately adjacent said tubes within a respective one of said circular rows;

said rings being sized for preloading said tubes by deflecting them when cool inwardly from their as-welded condition with the radii of said rings when cool being substantially between the radii calculated to result in negligible deflection from the vertical of the tubes during maximal operating temperatures and the radii calculated to result in minimal maximum deflection from the vertical over the range of temperatures expected in said heat exchanger.

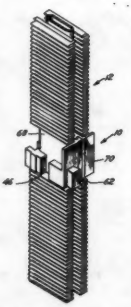


4,570,704

SUPPORT FOR HEAT EXCHANGER TUBES

Richard R. Braun, El Paso, Tex., and Charles E. Cedar, Hibbing, Minn., assignors to L & M Radiator, Inc., Hibbing, Minn.

Filed Mar. 26, 1984, Ser. No. 593,482
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—162 **8 Claims**



1. A support for application to a tube-and-fin assembly, a series of said tube-and-fin assemblies being individually removably incorporated into a heat exchanger, comprising:

a first support section defining a first lateral engagement surface; and

a second support section defining a second lateral engagement surface;

said first and second support sections cooperatively defining a central channel adapted to receive said tube-and-fin assembly, a first longitudinal engagement surface, and a

second longitudinal engagement surface, said first and second longitudinal engagement surfaces and said first and second lateral engagement surfaces engaging adjacent supports within said heat exchanger; and

secure means for securing said second support section relative to said first support section to affix said support to said tube-and-assembly;

said first and second support sections cooperatively defining longitudinal and lateral interlock means for interlocking adjacent supports against substantially longitudinal and lateral forces;

said longitudinal interlock means including a longitudinal interlock projection and a longitudinal interlock groove, said longitudinal interlock projection and groove having a matched configuration and being substantially longitudinally aligned;

said lateral interlock means including a first lateral interlock projection and a pair of lateral interlock channels, one of said lateral interlock channels being displaced longitudinally with respect to said first lateral interlock projection, said lateral interlock projection and said lateral interlock channels having a matched configuration, said lateral interlock means being adapted to interlock adjacent supports within said heat exchangers irrespective of configuration;

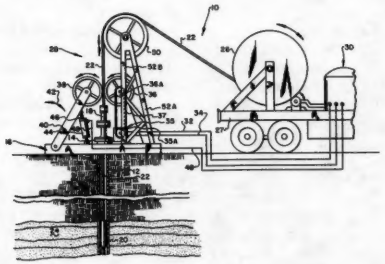
said engagement and interlocking of adjacent supports structurally strengthening said heat exchanger and providing a force dissipation system within said heat exchanger, without substantially inhibiting individual removability of said tube-and-fin assemblies from said heat exchanger.

4,570,705

SHEAVE DRIVE ASSEMBLY FOR FLEXIBLE PRODUCTION TUBING

John B. Walling, P.O. Box 16266, Ft. Worth, Tex. 76133

Filed Mar. 26, 1984, Ser. No. 593,579
Int. Cl.[4] F21B *19/08*
U.S. Cl. 166—77 **2 Claims**



1. Apparatus for inserting and withdrawing flexible production tubing into and out of a well, said flexible production tubing having a first plurality of sidewall portions joined together and transitioning along one or more curved apex sidewall portions constituting a first frictional drive surface, and a second plurality of sidewall portions being joined by one or more curved apex sidewall portions constituting a second frictional drive surface; said apparatus comprising, in combination:

a crown sheave mounted for rotation adjacent the well providing rotatable support for the flexible production tubing between the well and an external reel;

a drive sheave assembly disposed adjacent the well for inserting and retracting the flexible production tubing into and out of the well bore, said drive sheave assembly including a drive sheave having an annular groove formed by drive sheave sidewall portions which conform, in cross section, with the first frictional drive surface of the flexible production tubing and an idler mounted for pivotal movement into and out of engagement with the flexible production tubing, said idler sheave having an annular groove formed by idler sheave sidewall portions which conform, in cross section, with the second frictional drive surface of the flexible production tubing; and,

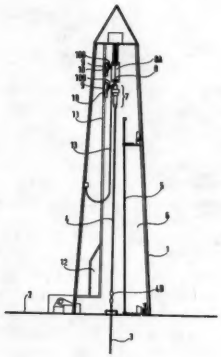
power means coupled to the idler sheave for driving the idler sheave into yieldable engagement with the second frictional drive surface of the flexible production tubing.

4,570,706

DEVICE FOR HANDLING RODS FOR OIL-WELL DRILLING

Gérard Pugnet, la Chapelle sur Erdre, France, assignor to Alsthom-Atlantique, Paris, France

Filed Mar. 15, 1983, Ser. No. 475,564
Claims priority, application France, Mar. 17, 1982, 82 04506
Int. Cl.[4] E21B *19/07*; B25B *17/00*
U.S. Cl. 166—77.5 **4 Claims**



1. A device for handling rods for oil-well drilling, said device comprising a motor operatively associated with a reduction gear, a hook suspending said motor, said motor rotating a hollow vertical shaft about its axis, said shaft being connected to a drilling sludge inlet pipe, the improvement wherein a jack is disposed around said shaft, said jack having a cylinder integral with the shaft, an annular piston within said cylinder, said piston being rotatable with the shaft, means for effecting translation movements of said piston parallel to said axis, said piston being extended outside the cylinder by a tubular end piece which has a screw thread at a lower portion for screwing onto a drilling rod, the device further including a set of retractable claws and a set of shoes which allow the first set of rods to be both supported and held motionless, guide units for guiding said set of claws and shoes, and means for preventing said guide units and said claw and shoes from rotating, including a housing fixed at one end to said motor and reduction gear and extending downwardly therefrom and about said guide units, means for fixedly mounting said guide units to the interior of said housing, such that said housing protects said guide units, said claws and said shoes, and said rotation prevention means further comprising a carriage which slides along stationary vertical tracks and a connection system having a jack and a connecting rod between said carriage and said reduction gear which allow a sideways movement of the device as a whole.

4,570,707

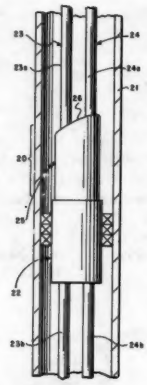
RELEASABLE LATCH FOR DOWNHOLE WELL TOOLS

John R. Setterberg, Jr., Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 588,147, Mar. 9, 1984, abandoned. This application Oct. 29, 1984, Ser. No. 665,754

Int. Cl.[4] E21B *23/00*

U.S. Cl. 166—214 20 Claims



1. A latch for releasably anchoring well tools at a preselected downhole location defined in part by an annular recess comprising:

a. a mandrel;

b. means for locking the mandrel with the recess;

c. the locking means slidably mounted on the mandrel;

d. backup means having a first position which allows disengagement of the locking means from the recess and a second position which holds the locking means against disengagement from the recess;

e. first frangible means holding the backup means in its first position and releasing the backup means in response to application of a predetermined force tending to move the backup means to its second position; and

f. second frangible means for holding the backup means in its second position.

4,570,708

METHOD OF USING PIPES RESISTANT TO HYDROSULPHURIC ACID

Jan Tiberg, Hofors, Sweden, assignor to SKF Steel Engineering AB, Hofors, Sweden

Filed Apr. 20, 1983, Ser. No. 486,735

Claims priority, application Sweden, Apr. 30, 1982, 8202728

Int. Cl.[4] E21B *17/00;* C21D *7/02*

U.S. Cl. 166—244.1 9 Claims

1. A method of using a high-strength steel pipe in an acid-environment comprising immersing and using said pipe in a fluid having an H_2S partial pressure in a gaseous phase of at least 300 Pa or in which the H_2S content in the liquid phase has a corresponding equilibrium pressure, said pipe being a high-strength pipe manufactured from a cold-deformed carbon steel or low alloyed steel having the following composition by weight:

C 0–1.20%
Si 0–1.0%
Mn 0–3.0%
Cr 0–2.0%
Ni 0–1.0%
Mo 0–1.0%
Cu 0–1.0%
V 0–0.3%
Nb 0–0.2%
Ca 0–0.05%

Fe+incidental ingredients and impurities up to 100%; wherein the degree of cold-deformation is at least 10% and wherein said pipe is used in said cold-deformed condition without subsequent toughening by austenitizing.

4,570,709

METHOD AND DEVICE FOR EFFECTING, BY MEANS OF SPECIALIZED TOOLS, SUCH OPERATIONS AS MEASUREMENTS IN HIGHLY INCLINED TO THE VERTICAL OR HORIZONTAL WELL PORTIONS

Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

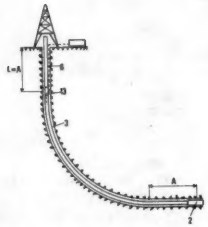
Continuation-in-part of Ser. No. 357,519, Mar. 12, 1982, Pat. No. 4,457,370. This application Apr. 5, 1984, Ser. No. 596,986

Claims priority, application France, Mar. 13, 1981, 81 05271

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] E21B *23/08, 43/112, 47/00*

U.S. Cl. 166—250 9 Claims



1. A method for effecting logging or servicing operations in a predetermined zone of a bore hole having, from the ground surface, an initial portion followed by an inclined or horizontal portion, with said predetermined zone being located beyond said initial portion of the well, the method comprises the steps of, (a) fixedly securing at the ground surface a logging or servicing tool body to the lower end of a first rod of a string of rods, with said tool body being electrically connected to a first electrical connector rigidly secured to said first rod and accessible from the upper portion thereof, (b) assembling the string of rods, by end-to-end connection of new drill rods above the first rod, and progressively lowering the assembly of the tool body and the string of rods into the well as it is assembled, and in the absence of an external conduit extending within said bore hole from the ground surface to said predetermined zone, for supporting, at its lower end, said string of rods after assembled, (c) introducing a second plug-in electrical connector for use in a liquid medium, in the string of rods, from the surface, with said second connector being mechanically secured to the lower end of an electrical transmission cable and electrically connected to the surface through said cable, and with said method further comprising:

(1) lowering said second connector, secured to said cable and weighted, into the string of rods when the tool body is positioned substantially at the predetermined zone of the well, by sliding the cable through a sealing member secured at the surface to the string of rods, and with said sealing member comprising a special sub with a lateral port through which the cable is passed, and which is secured to the upper end of the string of rods;

(2) displacing said second connector through the inclined or horizontal portion of the string of rods by pumping a fluid through the string of rods from the surface in a manner so as to exert a moving force on said second connector until said second connector operatively connects to said first connector;

(3) displacing the tool through the well by adding a tubular

string of rod elements above the special sub to thereby position the tool body in the predetermined zone of the well;

(4) rotating said tool without rotating the entire string of rods; and

(5) effecting the logging or servicing operation in said zone.

4. A device for effecting logging or servicing operations with the use of a specialized tool, in a predetermined zone of a bore hole, comprising in combination a first hollow rigid rod at the end of which is fixedly secured the tool, and constructed such that no external conduit extending within the bore hole from the ground surface to said predetermined zone is required for supporting, at its lower end, said string of rods when said device is in use after being assembled, a first electrical connector connected to the tool, a string of rods connectable to the upper portion of said first rigid rod, and an electrical cable provided at its end with a second electrical connector complementary to the first connector for connection thereto, and said string of rods comprising: at its upper portion, a sealing member adapted for having the cable slide therethrough into the string of rods, and said second connector is weighted and provided with means for causing it to move downwardly through the string of rods by the effect of a fluid pressure generated inside the string of rods on the second connector, and wherein said sealing member comprises a special sub having a lateral port through which the cable can pass, with said special sub adapted for being mounted on the top of the string of rods, and for being displaced into the bore hole by a distance A through which said tool is to be moved in said predetermined zone, and said device further comprising rotating means for rotating the tool without rotating the entire string of rods.

4,570,710

METHOD FOR PREVENTING WELLBORE DAMAGE DUE TO FINES MIGRATION

Lawrence R. Stowe, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 20, 1984, Ser. No. 622,514

Int. Cl.[4] E21B *43/12, 49/00*

U.S. Cl. 166—250 **24 Claims**

1. A method for treating a hydrocarbonaceous formation or reservoir to control the migration of formation or reservoir fines, said formation or reservoir having a certain critical salinity rate and critical fluid flow velocity, where in combination the critical salinity rate is determined, the salinity reduction varied and the critical fluid flow velocity is changed resulting in the minimization of the plugging of pores and channels near the wellbore which comprises the steps of:

(a) determining the critical salinity rate and the critical fluid flow velocity of the formation or reservoir surrounding the wellbore;

(b) injecting a saline solution into the formation or reservoir at a velocity exceeding the critical fluid flow velocity and at a saline concentration rate decrease below the determined critical salinity rate which combination is sufficient to cause the fines or particles to be transferred and fixed deep within the formation or reservoir without plugging the formation or wellbore; and

(c) producing a hydrocarbonaceous fluid from the formation or reservoir at a velocity such that the critical flow velocity is not exceeded deep said formation or reservoir which causes said fines or particles to remain fixed deep within said formation or reservoir which results in a minimization of the plugging of said pores and channels.

4,570,711

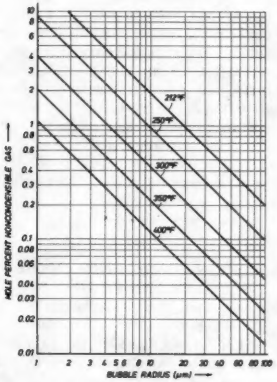
PROCESS FOR OPTIMIZING THE NONCONDENSIBLE GAS CONTENT OF AN OIL-DISPLACING STEAM-FOAM-FORMING MIXTURE

Andrew H. Falls, Sugarland; Jimmie B. Lawson, and George J. Hirasaki, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 9, 1984, Ser. No. 639,157

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—272 **7 Claims**



1. In a process in which a mixture of noncondensible gas, wet steam, and at least one surfactant that is dissolved or dispersed in the liquid phase of the wet steam, is injected into a subterranean reservoir to reduce the mobility of the injected steam-containing fluid relative to the mobility of steam alone, an improvement for minimizing the amount of noncondensible gas needed to provide substantial mobility reduction with a steam-foam-forming mixture containing a given kind and amount of surfactant or surfactant and electrolyte comprising:

including within the injected fluid a proportion of noncondensible gas which is provided by a solution to the gas proportioning equation

$$y_2^g(r) = \frac{1}{1 + \frac{3rp_1^g(r)}{2\sigma}}$$

where $y_2^g(r)$ is the mole fraction of noncondensible gas in the vapor phase of the injected steam for a bubble of radius r;

r is the radius of a steam bubble equaling the pore radius of the portion of the reservoir being contacted by the injected fluid;

$p_1^g(r)$ is the partial pressure of steam in a bubble of radius r which is very closely approximated by the vapor pressure of steam at the temperature of the heated zone; and

σ is the interfacial tension between the vapor and liquid phases of the steam.

4,570,712

CARBON DIOXIDE AND HYDROCARBON SOLVENT FLOODING IN A STEEPLY DIPPING RESERVOIR

George P. Kokolis, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,146

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—273 **9 Claims**

1. A method of conducting a miscible carbon dioxide and

solvent flood in a steeply dipping reservoir, consisting essentially of:

(a) injecting through at least one injection well a mixture of carbon dioxide and enriching hydrocarbon solvent at the updip end of a dipping hydrocarbon reservoir for forming a carbon dioxide and solvent front advancing to the downdip end of the reservoir, said enriching solvent mixed with the carbon dioxide in a concentration sufficient to achieve at least multiple contact miscibility between said mixture and the underground hydrocarbons at a point of injection into the reservoir;

(b) decreasing the concentration of hydrocarbon solvent in carbon dioxide while maintaining at least multiple contact miscibility between the injected mixture of carbon dioxide and decreased concentration solvent and the underground hydrocarbons as the carbon dioxide and solvent front moves downdip, said concentration of solvent decreased as the concentration of solvent needed to maintain at least multiple contact miscibility decreases with increasing vertical depth in the formation; and

(c) recovering hydrocarbons and carbon dioxide from at least one production well located downdip of the injection well.

4,570,713

AQUEOUS SILICON COMPOUNDS IN OIL WELL RECOVERY METHODS

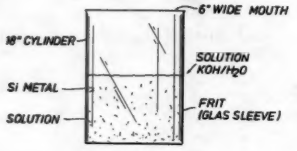
G. Kenneth Rice, Sugarland, Tex., assignor to Teknico Industries, Inc., Richmond, Tex.

Continuation-in-part of Ser. No. 723,530, Apr. 15, 1985, which is a continuation-in-part of Ser. No. 671,684, Nov. 15, 1984, which is a continuation of Ser. No. 527,752, Aug. 30, 1983, abandoned. This application May 3, 1985, Ser. No. 730,061

Claims priority, application United Kingdom, Sep. 24, 1982, 8227259

Int. Cl.[4] E21B *43/16*

U.S. Cl. 166—275 **4 Claims**



1. In a method of recovering oil from an oil bearing material utilizing a flooding agent the improvement comprising using as the agent a solution of a silicon compound formed by combining silicon, an alkali metal hydroxide, and water, in the ratio of 6:1:10 respectively, by mole percent.

4,570,714

GRAVEL PACK ASSEMBLY

Dewayne Turner, Breaux Bridge; Raymond A. Menard, and Dean Oneal, both of Lafayette, all of La., assignors to Geo Vann, Inc., Houston, Tex.

Filed Dec. 22, 1983, Ser. No. 564,756

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—278 **13 Claims**

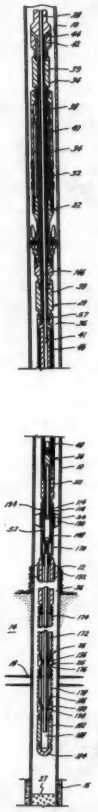
1. A crossover/release assembly for a screen assembly to treat a formation, comprising:

a tubular body having an axial flow bore therethrough and a lower end telescopingly received within the screen assembly;

a sliding piston disposed within said tubular body having an upper portion closing said flow bore to fluid flow and a lower tubular portion extending into said screen assembly;

a first fluid communication means through said upper piston portion and tubular body providing fluid communication between said flow bore and the exterior of said tubular body;

a second fluid communication means through the walls of said tubular body and said lower tubular piston portion providing fluid communication around said upper piston portion; and



said sliding piston reciprocating between a first position connecting said tubular body with the screen assembly and a second position releasing the screen assembly from said tubular body.

4,570,715

FORMATION-TAILORED METHOD AND APPARATUS FOR UNIFORMLY HEATING LONG SUBTERRANEAN INTERVALS AT HIGH TEMPERATURE

Peter Van Meurs, and Cor F. Van Egmond, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 6, 1984, Ser. No. 597,764

Int. Cl.[4] E21B *23/00, 36/04*

U.S. Cl. 166—302 **30 Claims**

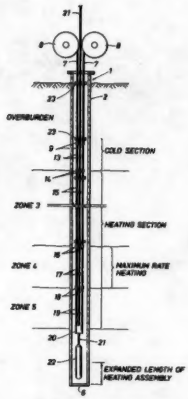
1. A process for heating a significantly long interval of subterranean earth formations, comprising:

constructing at least one electrical heating cable consisting essentially of (a) an electrically conductive central core having a relatively low electrical resistance, (b) an insulation around said core comprising a compressed mass of solid particles of electrically nonconductive, heat-stable

material, and (c) a metal sheath around said core and insulation having significant softening resistance and tensile strength;

arranging at least one of said heating cables to provide a heater capable of (a) being extended throughout the interval to be heated, and (b) generating selected temperatures between about 600° to 1000° C. in response to a voltage which is less than the sparking potential of the insulation between the core and sheath;

arranging a pattern with distance along said heater of combinations of heating cable core cross-sectional areas and heating cable core resistances which pattern is correlated with the pattern of heat conductivity with distance which exists along said interval of earth formations to be heated, so that localized increases and decreases in the average



electrical resistance with distance along the heater have magnitude and relative positions similar to those of localized increases and decreases in the heat conductivity in the adjacent earth formations in a manner capable of resulting in a substantially uniform rate of heat injection into the earth formations;

positioning said heater within the borehole of a well so that the heater is both located along the interval of earth formations to be heated and isolated from contact with fluid flowing into or out of the earth formations to be heated; and

operating the heater by applying a voltage sufficient to generate temperatures of about 600° to 1000° C. along the heater to effect said substantially uniform rate of heat injection.

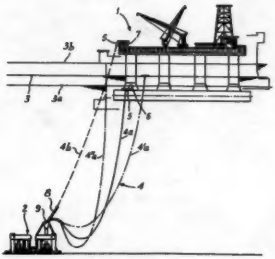
4,570,716

SYSTEM AND APPARATUS OF LIASON BETWEEN AN UNDERWATER WELLHEAD AND A SURFACE SUPPORT

Maurice Gènini, Creteil, and René Szabo, Le Pecq, both of France, assignors to Coflexip, Paris, France

Filed Dec. 28, 1983, Ser. No. 566,398
Claims priority, application France, Dec. 28, 1982, 82 21907
Int. Cl.[4] E21B *43/01*
U.S. Cl. 166—346 **3 Claims**

1. A method of flowing hydrocarbons through a flexible conduit from an underwater well to a surface support, and for lowering well working tools into the well through the same flexible conduit, said method comprising connecting a lower connector end of a flexible conduit downwardly into an upwardly opening underwater connector of the well, connecting an upper end of the flexible conduit to a hydrocarbon receiving station of the surface support, flowing hydrocarbons through the flexible conduit while permitting the flexible conduit to assume a goose neck and catenary configuration to compensate for the effects of waves and water levels, limiting the radius of deflection of the flexible conduit adjacent said lower connector end with a deflection limitor, disconnecting the upper end of the conduit from the hydrocarbon receiving station on the



surface support, then connecting the flexible conduit to the surface support at a work station with the conduit tensioned and sufficiently straight between its upper and lower ends to move tools into the well, and lowering a tool into the well through the flexible conduit.

4,570,717

ANTI-TWIST CONTROL SYSTEM FOR DEVIATED CONDUCTOR DRIVING SYSTEMS

James K. Simpson, 4334 Earhart Blvd., New Orleans, La. 70125

Division of Ser. No. 499,976, Jun. 7, 1983, Pat. No. 4,497,372.
This application Sep. 10, 1984, Ser. No. 648,816
Int. Cl.[4] E21B *7/20*
U.S. Cl. 166—335 **3 Claims**

1. A method for countering any undesired twisting of a deviated conductor which is to be deviated in a desired direction as it is driven into a substratum from an offshore platform, comprising the following steps:

a. providing a flexible, extended member and a winch on the platform structure;

b. wrapping a portion of said flexible member about a portion of the conductor casing and connecting another portion of said flexible member to said winch; and

c. When undesired twisting of the conductor casing takes place, actuating said winch to pull in said flexible member rotating the casing to an extent sufficient to counter the undesired twisting in the conductor casing.

4,570,718

OIL LEVEL SENSOR SYSTEM AND METHOD FOR OIL WELLS

Harold P. Adams, Jr., 101 Elm St., Oil City, Pa. 16301

Filed Dec. 21, 1984, Ser. No. 684,481
Int. Cl.[4] E21B *47/04*
U.S. Cl. 166—369 **12 Claims**

1. A system for controlling production in an oil well wherein

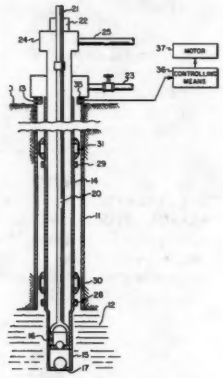
the oil well comprises a cased borehole, tubing within said cased borehole, a pump at the lower end of the tubing arranged to pump oil into said tubing, sucker-rods extending down into said tubing for mechanically activating said pump, means for causing reciprocation of the sucker-rods;

a controller for activating the means for causing reciprocation;

first sensing means secured to the outer surface of the tubing near the lower end thereof comprising a radioactive source spaced from a radioactivity detector such that oil at that level will fill the said space, means associated with said radioactivity detector for counting the output of the detector and establishing an "off signal" when the frequency of the output is indicative of no oil in the said space;

means for converting the "off signal" into a sonic signal directed up the borehole;

an electrical power supply for energizing means for sensing, means for counting and means for converting;



receiving means at the top of the borehole for detecting the acoustical representation of the "off signal" and transmitting it as an electrical signal to said controller whereby said controller stops the means for causing reciprocation.

11. A method for controlling production in an oil well wherein the oil well comprises a cased borehole, tubing within said cased borehole, a pump at the lower end of the tubing arranged to pump oil into said tubing, sucker-rods extending down into said tubing for mechanically activating said pump, means for causing reciprocation of the sucker-rods comprising the steps for:

sensing radioactivity emitted from a first radioactive source near the lower end of the tubing and generating an "off signal" when the frequency of the radioactivity is indicative of no oil at the level of the radioactive source;

converting the "off signal" into a sonic signal directed up the borehole;

detecting the acoustical representation of the "off signal" at the well head and stopping the reciprocation of the sucker-rods in response to said "off signal".

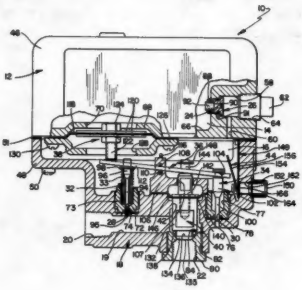
4,570,719

DRY PIPE VALVE ACCELERATOR

David A. Wilk, deceased, late of West Warwick, R.I. (by Lois Wilk, executrix), assignor to Grinnell Fire Protection Systems Company, Inc., Cranston, R.I.

Filed Jun. 1, 1984, Ser. No. 616,484
Int. Cl.[3] A62C *37/06*
U.S. Cl. 169—20 **19 Claims**

1. An accelerator for use in combination with a differential-type dry pipe valve in a dry pipe sprinkler system and the like wherein the system normally contains a pressurized gas, said accelerator comprising a valve body having a passage therethrough, said passage having inlet and outlet ends which are interconnectable to the pressurized portion of said sprinkler system and to the intermediate chamber of said dry pipe valve, respectively, an exhaust valve element in said valve body alternatively positionable in open or closed positions thereof for opening or closing said passage, respectively, said exhaust valve element being normally biased to the closed position thereof, a housing adjacent said valve body, the interior of said housing being interconnected with said passage through an antiflood aperture in said accelerator and being interconnected with the exterior of said accelerator through a relief port in



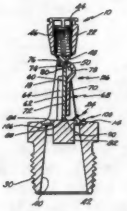
said accelerator, an antiflood valve in said accelerator alternatively positionable in open or closed positions thereof for opening or closing said antiflood aperture, respectively, a relief valve in said accelerator alternatively positionable in open or closed positions thereof for opening or closing said relief port, respectively, and means communicating with said passage inlet end for moving said antiflood valve to the closed position thereof, said relief valve to the open position thereof and said exhaust valve element to the open position thereof when the rate of pressure decay in said inlet end exceeds a predetermined level.

4,570,720

SPRINKLER HEAD

James G. Retzloff, Lansing, and Gerald W. Sanders, Hastings, both of Mich., assignors to The Viking Corporation, Hastings, Mich.

Filed Jul. 18, 1980, Ser. No. 170,049
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—39 **1 Claim**



1. A sprinkler head including a body defining a nozzle, a pair of arms extending upwardly from the nozzle and being joined opposite said nozzle, said arms defining a pivot point opposite said nozzle and which pivot point is offset from a central axis of said nozzle, a cap disposed within said nozzle, a fusible mechanical link means extending between said cap and said pivot point, said link means including a pair of rigid members held together by a temperature responsive and fusible material,

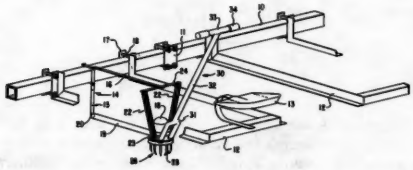
one of said rigid members engaging said pivot point and the other of said rigid members engaging said cap, wherein the improvement comprises: resilient means disposed between said body and said cap for creating a force which will throw said link means away from said sprinkler head when a predetermined temperature range is reached at which the temperature responsive material fuses and permits said rigid members to separate and wherein said arms are essentially unstressed so as not to create a spring force capable of throwing said cap and said link means out and away from said nozzle, said resilient means being an annular-shaped, resilient, concave, disc-like member having a peripheral edge engaging said body at said nozzle and a central aperture within which said cap is disposed, each of said members of said pair of rigid members of said link means being generally flat, said rigid members being positioned against each other with said temperature responsive material sandwiched therebetween, said concave, disc-lik member having a compression rate within the range of 85 pounds per inch to 100 pounds per inch at an overall compressed height of 0.021 inches, and said concave, disc-like member having a minimum compression rate of 60 pounds per inch at an overall compressed height of 0.034 inches and a nonlinear load curve to permit thereby a wide range of latitude during assembly of the head without an adverse effect on operation.

4,570,721

DEVICE FOR WEEDING VINE OR SIMILAR CROPS

Pat Mentele, P.O. Box 41, Woonsocket, S. Dak. 57385

Filed Apr. 12, 1984, Ser. No. 599,655
Int. Cl.[4] A01B *33/06, 33/14*
U.S. Cl. 172—99 **4 Claims**



1. For mounting on a tractor having a tool bar, a device of the class described comprising a bracket removably mounted on said tool bar, said bracket having a vertically oriented member and a horizontal member extending in fixed position from the upper part of said vertically oriented member, a transverse member mounted on said horizontal member remote from said vertical member, bar means mounted on the lower end of the vertically oriented member beneath said horizontal member and spaced therefrom, said bar means being universally pivotally movable relative to said vertically oriented member, mechanically driven soil agitating means fixed to said bar means, and a pair of springs each having one end attached to said transverse member and the other end attached to said bar means near said soil agitating means, said first ends being spaced apart a wider distance than said other ends whereby said soil agitation means is resiliently and self-centeringly suspended.

4,570,722

FREE FLOATING FOLDABLE TOOL BAR

Harley G. Osborn, Zearing, Iowa, assignor to Gary W. Clem, Inc., Nevada, Iowa

Filed Jan. 4, 1984, Ser. No. 568,123
Int. Cl.[3] A01B *73/00*
U.S. Cl. 172—311 **1 Claim**

1. A folding tool bar apparatus for a farm implement or the like comprising:

a horizontal disposed main frame;

a wing section pivotally attached to one end of said main frame along a first horizontal axis;

gauge wheel means attached to said wing section for spacing said wing section a predetermined distance above the ground beneath it;

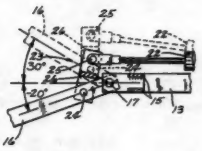
a rigid link member pivotally attached to said wing section along a second horizontal axis, said link member having two downwardly depending legs, and a connecting stop structure, said second horizontal axis extending through said wing section and through said downwardly depending legs;

a hydraulic cylinder;

means for pivtally attaching said hydraulic cylinder to said main frame;

means for pivotally attaching said link member along a third horizontal axis to said hydraulic cylinder so that said third horizontal axis is held in a fixed location with respect to said rigid link member;

said hydraulic cylinder having a first elongated position for permitting said wing member to be in a substantially horizontally extended working position and a second shortened position for causing said wing member to be in a substantially folded transport position;



said first, second and third horizontal axes being parallel with respect to each other;

means for permitting adequate clearance among said hydraulic cylinder, link member, main frame and wing member for permitting said wing member to pivot upwardly and downwardly from said horizontally disposed main frame when said hydraulic cylinder is in the first extended position thereof depending upon the contour of the land below the wing section; and

said stop structure being disposed on said link member for preventing said wing section from pivoting beyond a predetermined amount downwardly, said stop structure having a first end surface for abutment with a first surface on said wing section to limit the downward movement of said wing member and a second end surface on said stop structure spaced from a second surface on said wing section to permit upward limited movement of the wing section without adjusting the length of the hydraulic cylinder.

4,570,723

MACHINE FOR DRIVING HOLES IN THE GROUND

Alexandr D. Kostylev; Andron T. Karavaev; Vladimir D. Plavskikh; Alexei D. Terskov; Nikolai P. Chepurnoi, all of Novosibirsk; Igor I. Reznikov, and Vladimir I. Tarasenko, both of Odessa, all of U.S.S.R., assignors to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR, Novosibirsk, U.S.S.R.

Filed May 16, 1984, Ser. No. 610,836
Claims priority, application U.S.S.R., May 16, 1983, 3632032
Int. Cl.[4] B25F *5/02*
U.S. Cl. 173—116 **4 Claims**

1. A device for driving holes in the ground comprising:

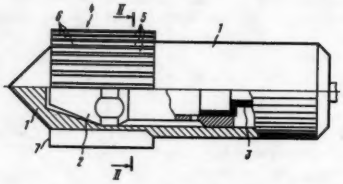
a cylindrical housing including

a head end;

a hammer movably disposed in said housing for delivering impacts on said head end of said housing;

an air distribution means connected to said housing for controlling the movement of said hammer;

longitudinal projections having outer surfaces and longitudinal recesses having inner surfaces, said projections and recesses arranged on the outer surface of said head end of said housing with said outer and inner surfaces extending substantially parallel to the axis of said housing;



said cylindrical housing having a diameter substantially greater than the diameter of a circle described about the inner surfaces of said recesses and less than the diameter of a circle described about the outer surfaces of said projections.

4,570,724

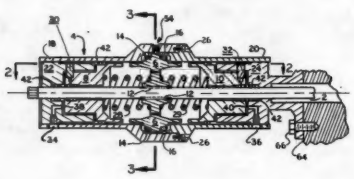
STEPWISE ROTARY ACTUATOR

Hollis G. Robison, Magnolia, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Aug. 23, 1984, Ser. No. 643,603

Int. Cl.[4] F16H *27/02*; F01B *3/00*; E21B *43/12*

U.S. Cl. 175—113 **12 Claims**



1. An apparatus for imparting stepwise, unidirectional rotary motion to a shaft member, comprising:

a drive wheel, secured about said shaft against relative rotational motion therebetween;

a drive piston, disposed about said shaft and rotatably movable and axially translatable with respect thereto, further including means for engaging the drive wheel upon translation of the drive piston toward the drive wheel for the prevention of relative rotational motion between the engaged drive wheel and drive piston;

a housing, disposed about the drive wheel and drive piston and secured against rotational motion, the housing further including a cam race disposed therein;

means for reciprocating the drive piston between a first axial position unengaged with the drive wheel and a second axial position engaged with the drive wheel;

a follower pin, secured to the drive piston and projecting radially outward therefrom, said follower pin being movable within the cam race for defining the angular position of the drive piston during the reciprocation thereof; and

wherein the cam race is configured so as to

a. not require angular displacement of the drive piston during a first inward portion of the drive piston axial displacement, said first inward axial displacement portion being sufficient to engage said engagement means,

b. induce a relative rotational displacement of the drive piston during the remaining portion of the inward axial displacement of the drive piston, said first relative rotational displacement occurring between the housing and the drive piston, being in the direction of the desired stepwise rotary motion, and being equal in magnitude to the desired stepwise rotational increment,

c. not require angular displacement of the drive piston during a first outward portion of the drive piston return axial displacement, said first outward axial return displacement portion being sufficient to disengage said engagement means, and

d. induce a second relative rotational displacement of the drive piston during the remaining portion of the outward return axial displacement of the drive piston, said second relative rotational displacement being of equal magnitude and in opposite direction to the first relative rotational displacement, whereby the drive piston is returned to the position occupied thereby prior to the initiation of the drive piston reciprocation.

4,570,725

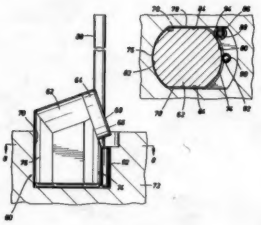
DRILL BIT CUTTER

Terry R. Matthias, Gloucester, and John D. Barr, Cheltenham, both of United Kingdom, assignors to NL Industries, Inc., New York, N.Y.

Filed Jan. 31, 1984, Ser. No. 575,556

Int. Cl.[4] E21B *10/46, 10/00*

U.S. Cl. 175—329 **7 Claims**



1. A cutter device for a drag-type drill bit, said cutter device comprising a mounting body comprising tungsten carbide, said mounting body having a stud portion defining one end thereof and a layer of cutting material, comprising polycrystalline diamond, carried adjacent the other end and defining a cutting formation, said stud portion having external side walls which, throughout a major part of the length of said stud portion and in transverse cross section, define a plurality of circumferentially spaced, concentric arcs of a circle, interrupted by a plurality of connector sections interconnecting said arcs and of greater radius of curvature than that of said circle.

4,570,726

CURVED CONTACT PORTION ON ENGAGING ELEMENTS FOR ROTARY TYPE DRAG BITS

David R. Hall, Provo, Utah, assignor to Megadiamond Industries, Inc., Provo, Utah

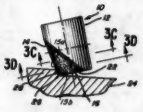
Continuation of Ser. No. 433,048, Oct. 6, 1982, abandoned. This application Mar. 4, 1985, Ser. No. 707,536

Int. Cl.[4] E21B *10/48*

U.S. Cl. 175—410 **2 Claims**

1. An insert for a rotary type drag bit for use in drilling through plastic-like material, said drag bit having a vertical axis and a horizontal axis perpendicular thereto, said insert comprising a shank portion for connection to the drag bit, a curved contact portion connected to said shank portion, an abrasive substance deposited over at least a portion of said curved contact portion for engaging the plastic-like material, and a free distal end surface upon which said abrasive material is not deposited, said curved contact portion having a blunt leading part and two symmetrical side parts adjacent thereto, said blunt leading part being convex in cross section perpendic-

ular to the vertical axis and each of said symmetrical side parts being partially convex in cross section perpendicular to the vertical axis such that said curved contact portion is symmetrical about a plane coincident with said vertical axis and has a non-uniform radius of curvature about said vertical axis in each



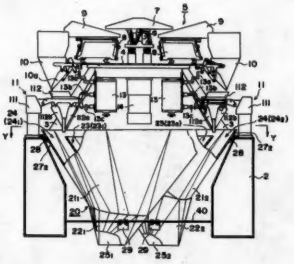
symmetrical side part of said curved contact portion for causing variations in the direction, magnitude or type of stress from point to point along said curved contact portion which provides a strain on said plastic-like material for removal of said plastic-like material.

4,570,727

COLLECTION CHUTE FOR AUTOMATIC WEIGHING APPARATUS

Kenji Ueda, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Nov. 7, 1984, Ser. No. 668,895
Claims priority, application Japan, Nov. 7, 1983, 58-172655
Int. Cl.[4] G01G *19/22, 21/28;* **B65G** *11/00*
U.S. Cl. 177—25 **7 Claims**



1. A collection chute in an automatic weighing apparatus having a plurality of weighing hoppers arranged in a circular pattern and each having an inner gate and an outer gate, comprising:

first and second upper chutes, each of said first and second upper chutes being composed of a substantially semi-circular inner collection member having upper and lower ends and a semi-circular outer collection member having upper and lower ends and being spaced from the inner collection members to define a clearance gap between said inner collection member and said outer collection member, said upper ends of said inner collection members defining said inner inlet ports confronting said inner gates, said clearance gaps between said inner and outer collection members defining upper openings serving as the outer inlet ports confronting said outer gates; and

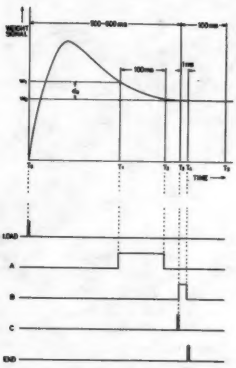
first and second lower chutes each having an upper end connected to the lower ends of said first and second upper chutes and having a lower end and an outlet port in the lower end, said first lower chute being in communication with a path defined by the clearance gap of said first upper chute and a path defined by the inner collection member of said second upper chute, said second lower chute being in communication with a path defined by the clearance gap of said second upper chute and a path defined by the inner collection member of said first upper chute, the upper ends of the first and second lower chutes confronting each other at an S-shaped intersection so that the upper opening of the first lower chute extends below the lower end of the inner collection member of the second upper chute, and so that the upper opening of the second lower chute extends below the lower end of the inner collection member of the first upper chute.

4,570,728

COMBINATION WEIGHING SYSTEM

Yoshiharu Toyoda, Akashi, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan

Filed Oct. 25, 1984, Ser. No. 664,501
Claims priority, application Japan, Oct. 31, 1983, 58-205620
Int. Cl.[4] G01G *19/22, 19/52*
U.S. Cl. 177—25 **9 Claims**



1. A combination weighing method, comprising the steps of:

loading each of a plurality of weighing units with products to be weighed and sampling the resultant weight indicative signals before they become stable,

subtracting a predetermined estimated deviation from each of said sampled unstable weight indicative signals to calculate an estimated value of the weight indicative signal having become stable,

effecting predetermined combination arithmetic operations with said calculated estimated values and storing the resultant information indicative of all combinations whose sum weights satisfy a predetermined weight condition,

summing said sampled stable weight indicative signals in accordance with said stored combinations to select from said stored combinations a combination whose sum weight satisfies a predetermined weight condition.

4,570,729

HIGH SPEED TRANSPORTING AND WEIGHING MACHINE WITH DYNAMIC BALANCE

Victor Del Rosso, Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Oct. 1, 1984, Ser. No. 656,485
Int. Cl.[4] G01G *19/00, 21/10*
U.S. Cl. 177—145 **11 Claims**

1. A machine for transporting and weighing or checkweighing articles passing in succession thereon at high speeds, such as for use in conjunction with a rapid article feeding and takeaway conveyor system or the like and with weight-signal transmitting/converting/calculating printout devices for vi-

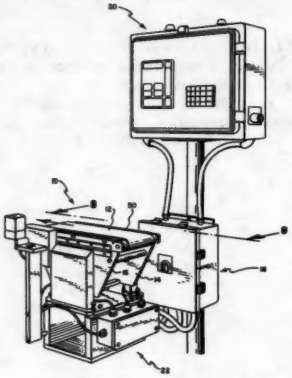
sual display and price labeling operations or the like; said machine comprising:

a stationary machine base;

a vertically flexible weight-measuring means supported by said base;

a rigid cage-like structure encompassing and supported by said weight-measuring means;

an article conveying device and a power supply means therefor carried by said cage-like structure and comprising in combination therewith the minusculely vertically shifting tare weight component of the machine;



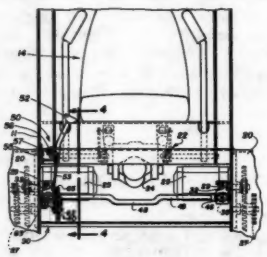
said conveying device and said power supply means and the construction elements of said cage-like structure being so weight-related and positioned in said cage-like structure as to be substantially statically balanced and in equilibrium about the axes of said weight-measuring means, whereby said measuring means is shielded from effects of transitory force impingements upon said tare weight assembly such as would otherwise induce torque moments to operate on said assembly about the axes of said measuring means.

4,570,730

SPEED SHIFTER LINKAGE FOR SKID-STEER LOADER

Charles M. Kline, Reinholds, and Randall L. Sierk, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 5, 1984, Ser. No. 647,946
Int. Cl.[4] B62D *11/00*
U.S. Cl. 180—6.48 **13 Claims**



1. In a skid-steer loader having a main body frame; an operator's compartment supported by said main frame; a source of primary power supported by said frame; transversely spaced wheel assemblies disposed on each side of said main frame for mobilely supporting said main frame over the ground; drive means operatively associated with said wheel assemblies for rotatably driving said wheel assemblies to provide locomotive power for said loader, said drive means including first and second transversely spaced hydraulic motors in flow communication with said source of primary power to provide a source of hydraulic fluid under pressure to said hydraulic motors, said hydraulic motors corresponding to said transversely spaced wheel assemlbies, each said motor having a movable cam plate shaft operable to change the output speed of the motors for a given flow rate; and control means operably connected to said cam plate shafts to effect a movement of said cam plate shafts to vary the output speed of the hydraulic motors, an improved control means comprising:

a pintle arm connected to each respective cam plate shaft;

a threaded trunnion pivotally fixed in each respective said pintle arm;

a cross shaft having oppositely wound threads at the opposing ends thereof, each respective end of said cross shaft being threadably received within a corresponding trunnion, such that rotation of said cross shaft effects a generally linear opposing movement of said trunnions, which in turn cause a corresponding rotation of said pintle arms and connected cam plate shafts for simultaneously changing the output speed of both said hydraulic motors; and

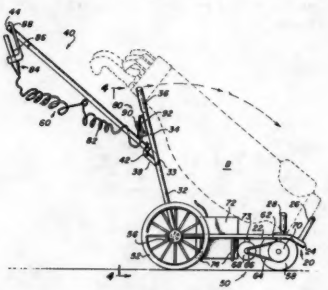
actuation linkage for selectively rotating said cross shaft.

4,570,731

CONTROLLABLE GOLF BAG CART

Del Oaks, 2599 N. River Rd., Warren, Ohio 44483

Filed Sep. 9, 1983, Ser. No. 530,720
Int. Cl.[4] B62D *51/04*
U.S. Cl. 180—19.3 **8 Claims**



1. In a motorized golf bag cart having a pair of main wheels on a common axis and a third stabilizing wheel on an axis parallel thereto and spaced therefrom, and having a frame for receiving thereon a golf bag, and further including motor means drivably connected to a said wheel, power means for said motor, and control means accessible to the cart operator for controlling power to the motor and thereby operation of the cart,

the improvement therein comprising

said frame having articulated components including a lower portion thereof and an upstanding bag support thereof,

said frame lower portion being defined by a laterally spaced pair of side rails with means mounting said power means therebetween whereby said power means includes portions disposed below said frame lower portion, thereby to lower the center of gravity of said cart,

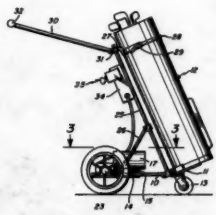
said upstanding bag support having means pivotally connecting the same to said lower frame portion to fold thereover and collapsing said cart, said bag support including a bifurcated portion thereof disposed in straddling relation to said power means when said bag support is in folded relation to said lower frame portion in fully collapsed condition.

4,570,732

MOTOR DRIVEN GOLF BAG CART

Charles G. Craven, 2231 Central St., Stoughton, Mass. 02072

Filed Aug. 22, 1984, Ser. No. 643,249
Int. Cl.[4] B62D *51/04*
U.S. Cl. 180—19.3 4 Claims



1. A motor driven golf bag cart of the tricycle type, said cart including a base consisting of a V-shaped member the apex of which is rearwardly disposed, a plate anchored to the forward position of said member, bag supporting means secured to said apex and including a rearwardly extending and upwardly inclined bag seat, an underlying trailing wheel attached to said seat and a forwardly and upwardly inclined member including a supporting portion and a guide portion extending forwardly of the front edge of said plate, said bag supporting means operable to hold a bag with the upper end thereof rearwardly of said front edge, a reversible motor and gear box mounted on said plate adjacent said edge, said gear box having transversely aligned drive shafts, said plate including means adjacent each side edge rotatably supporting the appropriate one of said shafts, a wheel for each shaft, one way clutch means connecting each wheel to the shafts therefor, brace means connected to an intermediate part of said supporting portion and the side portions of said plate, a drive for said motor including a battery supported by said plate rearwardly of the axis of said shafts, and control circuitry connecting said battery to said motor and including a pulse moderating control, a potentiometer, and a motor direction control mounted on one of said portions of said forwardly and upwardly inclined member.

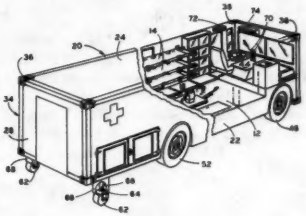
4,570,733

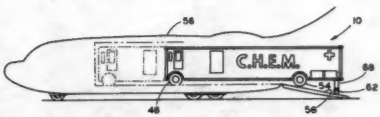
MOBILE HOSPITAL UNIT

Leon D. Star, Bldg. #198, Kennedy International Airport, Jamaica, N.Y. 11430

Filed Apr. 26, 1984, Ser. No. 604,329
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.[4] B62D *47/00*
U.S. Cl. 180—41 2 Claims

1. An emergency hospital unit adapted for transportation to, and use at, a site of a major disaster preparatory to providing emergency medical treatment to injured survivors thereat, said unit being comprised of a standard cargo container of the type capable of airlift transportation to a selected location in the immediate vicinity of said disaster site and bounding an internal area of approximately eight feet in width, eight feet in height and forty feet in length for storage of medical equipment and facilities, and a four-wheel drive operatively embodied in the aforesaid container adapted to provide surface transportability thereto for movement of said container from said selected location to said injured survivors, said four-wheel drive consisting of an internal combustion engine-operated pairs of wheels located adjacent the front and rear of said container, and in locations rearwardly of said combustion engine-operated pairs of rear wheels of said container and on opposite sides thereof a cooperating operative arrangement of an idler wheel and of a hydraulic cylinder, said hydraulic cylinders being selectively operable to urge said rear idler wheels from a retracted position through descending movement to maintain a horizontal orientation in said container during which only said front wheels are powered in rotation by said internal combustion engine to cause movement in said container in relation to an inclined loading ramp of an aircarft incident to the airlift transportation thereof, and in said retracted position of said idler wheels, said internal combustion engine being operable to power both said front and rear wheels





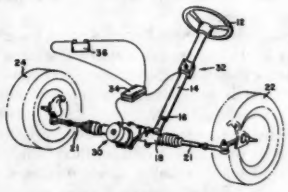
in rotation to thereby contribute to producing movement in said container, whereby said container has a four-wheel drive for facilitated movement at said disaster site and a horizontal orientation provided by said extended idler wheels during the loading and unloading thereof in relation to an inclined loading ramp incident to the airlift transportation thereof.

4,570,734

POWER ASSIST DEVICE FOR A VEHICLE STEERING SYSTEM

Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 8, 1984, Ser. No. 587,418
Int. Cl.[4] H04L *15/04;* H04R *1/28;* B62D *1/20*
U.S. Cl. 180—79.1 18 Claims



1. A power assist device for a vehicle steering system having a steering wheel connected to a steering gear to control the vehicle direction of travel by means of a pair of wheels cooperating with the steering gear via a steering linkage which includes a rack having a slot, the power assist device comprising an electric motor fixedly carried by the vehicle adjacent the steering linkage and remote from the steering gear, a plurality of gears cooperating with the electric motor and the rack of the steering linkage to impart movement to the rack in response to operation of the electric motor, one of said plurality of gears cooperating with said steering linkage by means of a portion extending into the slot of the rack to form a yoke-like connection which provides a variable ratio between said one gear and said rack so that for a predetermined movement of said one gear, the movement of said steering linkage is greater when said one gear is moved from a rest position correspond-

ing to straight ahead travel for the vehicle than when said one gear is moved from an end position corresponding to turning the vehicle, and power assist force imparted to the rack being greater when said one gear is moved from said end position than when said one gear is moved from said rest position.

4,570,735

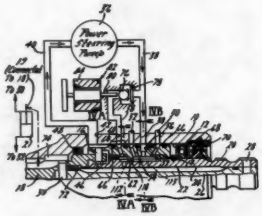
DUAL ROTARY VALVE FOR VARIABLE ASSIST POWER STEERING GEAR FOR AUTOMOTIVE VEHICLES

James J. Duffy, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 430,223, Sep. 20, 1982, abandoned. This application Oct. 22, 1984, Ser. No. 663,267

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—142 **17 Claims**



1. In a fluid pressure operated power steering gear mechanism having a fluid flow source, a pressure movable part adapted to be connected to a steering linkage for a vehicle, a drive member connected to said pressure movable part, a driving shaft connected to said drive member;

the connection between said drive member and said driving shaft comprising a torsion bar that accommodates angular displacement of said drive member relative to said driving shaft;

a rotary valve means situated in and partly defining pressure distribution and flow return passages extending to said pressure movable part and to said fluid flow source to effect pressure differential forces acting on said pressure movable part;

said valve means comprising an internal valve member and a surrounding sleeve;

said internal valve member having formed thereon two sets of valve lands, one set being axially displaced relative to the other, two sets of internal valve lands formed in said sleeve respectively registering with the valve land sets of said internal valve member;

said valve sleeve being connected operatively to said drive member for rotational movement therewith;

vehicle speed sensitive valve means for distributing fluid flow only to a first of said sets of valve lands at low vehicle speeds and for distributing fluid flow to both sets of said valve lands at high vehicle speeds;

said internal valve member being connected to and rotatable with said driving shaft, the first set of said registering valve lands being adapted to control pressure distribution to said pressure movable part during initial deflection of said torsion bar and being adapted to effectively increase the magnitude of the pressure distributed to said pressure movable part as said torsion bar deflection increases within a first range of deflection during operation at low vehicle speeds and the other set of registering valve lands being adapted to control pressure distribution through said passages to said pressure movable part upon deflection of said torsion bar within a greater range of deflection of said torsion bar as fluid is distributed simultaneously to both valve land sets at high vehicle speeds.

4,570,736

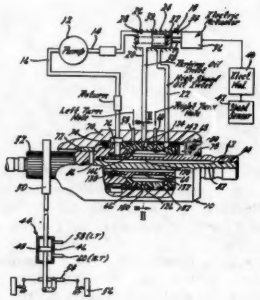
DUAL FLOW VARIABLE ASSIST POWER STEERING GEAR MECHANISM

Raymond D. Waldorf, Milford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,264

Int. Cl.[4] F15B *13/04*

U.S. Cl. 180—143 **6 Claims**



1. In a fluid pressure operated power steering gear mechanism having a fluid flow source, a pressure movable part adapted to be connected to a steering linkage for a vehicle, a drive member connected to said pressure movable part, a driving shaft connected to said drive member;

the connection between said drive member and said driving shaft comprising a torsion member that accommodates angular displacement of said drive member relative to said driving shaft;

a rotary valve means situated in and partly defining pressure distribution and flow return passages extending to said pressure movable part and to said fluid flow source to effect pressure differential forces acting on said pressure movable part;

said valve means comprising an internal valve member and a surrounding sleeve;

said internal valve member having formed thereon two sets of valve lands, one set being circumferentially offset relative to the other, two sets of internal valve lands formed in said sleeve respectively registering with the valve land sets of said internal valve member;

said valve sleeve being connected operatively to said drive member for rotational movement therewith;

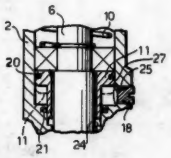
vehicle speed sensitive valve means for distributing fluid flow only to a first of said sets of valve lands at low vehicle speeds and for distributing fluid flow to both sets of said valve lands at high vehicle speeds;

said internal valve member being connected to and rotatable with said driving shaft, the first set of said registering valve lands being adapted to control pressure distribution to said pressure movable part during initial deflection of said torsion member and being adapted to effectively increase the magnitude of the pressure distributed to said pressure movable part as said torsion member deflection increases within a first range of deflection during operation at low vehicle speeds and the other set of registering valve lands being adapted to control pressure distribution through said passages to said pressure movable part upon deflection of said torsion bar within a greater range of deflection of said torsion bar as fluid is distributed simultaneously to both valve land sets at higher vehicle speeds.

4,570,737
POWER-ASSISTED RACK-AND-PINION STEERING APPARATUS

Ettore Cordiano, Turin, Italy, assignor to Corint s.r.l., Turin, Italy

Filed Mar. 9, 1984, Ser. No. 587,768
Claims priority, application Italy, Mar. 9, 1983, 67269 A/83; Dec. 23, 1983, 68351 A/83
Int. Cl.[4] B67D *5/06;* **F16K** *31/12*
U.S. Cl. 180—148 **7 Claims**



1. A power assisted rack and pinion steering apparatus, comprising

a casing,

a rack engaging helical tooth pinion,

a shaft connected to said pinion,

a bearing rotatably supporting said shaft within a cylindrical cavity of the casing, said bearing being slidably mounted with said cylindrical cavity to allow axial displacements of the pinion,

a control valve having a moveable member which is slidably mounted within an auxiliary cavity of the casing,

means for transforming an axial displacement of the pinion into a displacement of said moveable member of the control valve, said means including

a piston operatively connected to said bearing, with respect to axial displacements of the latter,

a chamber of variable volume defined within said cylindrical cavity and facing said piston, said chamber being filled with a deformable and substantially incompressible material,

a push rod operatively connected to said moveable member of the control valve, having one end surface arranged so as to sense the pressure within said chamber of variable volume,

wherein said deformable and substantially incompressible material is a fluid, said apparatus further includes sealing means for isolating said chamber of variable volume from the remaining part of said cylindrical cavity and from said auxiliary cavity,

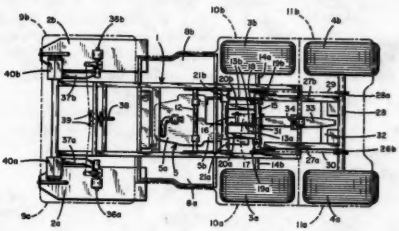
and wherein said sealing means are comprised of a deformable hollow sealing element which is filled with the incompressible fluid and is located within said chamber of variable volume, with its outer surface in contract with the piston and the push rod.

4,570,738
SNOW VEHICLE EQUIPPED WITH WIDE, LOW-PRESSURE TIRES

James E. Grinde, Anoka, and Douglas C. Foote, Coon Rapids, both of Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 3, 1985, Ser. No. 688,466
Int. Cl.[4] B62M *27/02*
U.S. Cl. 180—196 **14 Claims**

1. In a vehicle of the type comprising an engine mounted on a frame; a transmission integrally joined to said engine; right and left steerable front skis suspended from opposed sides of said frame proximate its front end; and at least one pair of right and left driving rear wheels having relatively low-pressure, wide tires, said driving rear wheels being suspended from axles on both the sides of a rear portion of said frame and adapted to be driven by said engine through a differential mechanism,

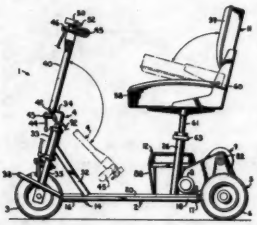


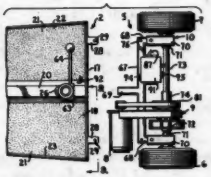
the improvement comprising having said front skis and said driving rear wheels of substantially the same width and in alignment in the longitudinal direction of said frame.

4,570,739
PERSONAL MOBILITY VEHICLE

DuWayne E. Kramer, Mission, Kans., assignor to Burke, Inc., Mission, Kans.

Filed Sep. 29, 1983, Ser. No. 537,297
Int. Cl.[4] B62D *61/08*
U.S. Cl. 180—216 **17 Claims**





1. A personal mobility vehicle comprising:

(a) a main frame unit including:

(1) a floor pan having a back end;

(2) a front wheel spindle pivotally connected to said pan.

(3) a front ground engaging wheel rotatably mounted on said spindle; and

(4) a steering tiller connected to said spindle;

(b) a rear drive unit including:

(1) a drive unit frame;

(2) a rear axle means rotatably mounted on said drive unit frame;

(3) a pair of spaced apart ground engaging rear wheels mounted on said rear axle means in spaced apart relation;

(4) a motor mounted on said frame;

(5) transmission means drivingly connecting said motor to said rear axle means; and

(6) frame connection means removably connecting said drive unit frame to said floor pan of said main frame unit with said floor pan back end adjacent said rear wheels;

(c) a seat unit including a seat member, said seat unit being connected to said floor pan of said main frame unit in proximity to said floor pan back end with said seat member in spaced relation to said pan;

(d) a battery unit including a battery member, said battery unit being removably positioned on said floor pan of said main frame unit in proximity to said back end thereof; and

(e) control means removably interconnecting said battery member with said motor to selectively operate said motor to propel said vehicle.

4,570,740

MOTORCYCLE

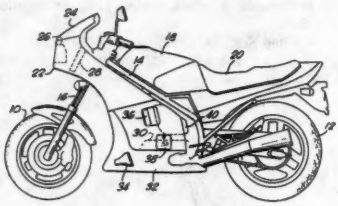
Kunitaka Hara, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 654,165

Claims priority, application Japan, Sep. 26, 1983, 58-177559

Int. Cl.[4] B62D *61/02;* **B60K** *11/00, 11/04;* **B62K** *1/00*

U.S. Cl. 180—229 **4 Claims**



1. A motorcycle comprising

a frame;

front and rear wheels resiliently mounted to said frame;

an engine mounted to said frame between said front and rear wheels;

a fuel tank mounted above said engine;

a radiator mounted above said front wheel in front of said fuel tank and having a water supply opening; and

a radiator baffle plate positioned above said radiator and including a downwardly extending panel between said radiator and said fuel tank, extending rearwardly to either side of the forward portion of said fuel tank, and an access port through said baffle plate above said water supply opening of said radiator.

4,570,741

MULTI-WHEEL DRIVE SYSTEM

Gregory A. McCoy, Bristol, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 2, 1984, Ser. No. 585,580

Int. Cl.[4] B60K *17/356, 1/00, 7/00*

U.S. Cl. 180—242 **6 Claims**

1. A controlled traction vehicle having two sides and four tractive wheels with a first and second wheel adjacent one side and a third and fourth wheel adjacent the other side and a propulsion means connected to the wheels for selectively driving the wheels, said propulsion means comprising:

a first hydraulic pump;

a first electrical motor connected to drive the first wheel;

a first clutching means connected to the first electrical motor and the first hydraulic pump for selectively connecting said first electrical motor to drive said first pump;

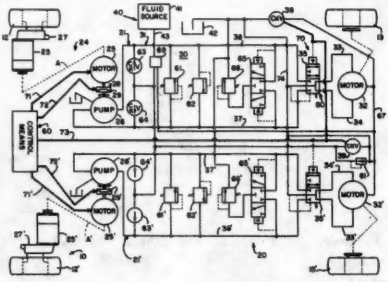
a hydraulic system having a first hydraulic power circuit connected to the first pump and a second hydraulic circuit;

a first hydraulic motor connected in the first hydraulic circuit to be driven by the first pump and connected to drive the second wheel;

a second hydraulic pump;

a second electrical motor connected to drive the third wheel;

a second clutching means connected to the second electrical motor and the second hydraulic pump for selectively connecting said second motor to drive said second pump;



said second hydraulic power circuit connected to the second pump;

a second hydraulic motor connected in the second hydraulic circuit to be driven by the second pump and connected to drive the fourth wheel;

a control means for controlling the operation of the first and second electrical motor and the first and second clutching means.

4,570,742

MICROPHONE APPARATUS

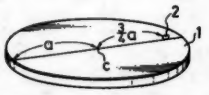
Tadashi Takise, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 531,541

Claims priority, application Japan, Sep. 27, 1982, 57-167998

Int. Cl.[3] G10K *11/00*

U.S. Cl. 181—175 **6 Claims**



1. A microphone apparatus comprising a rigid plate having a plain surface with a predetermined area, and a microphone element attached to said rigid plate so as to locate its sound receiving point at a peripheral position which is different from the center of said plate and a sound source spaced a vertical distance from said plain surface such that a sound pressure signal directly reaching said microphone element from said sound source has practically the same phase over the entire audible frequency band as signals caused by non-direct or reflecting waves on said plain surface, respectively at the sound receiving point of said microphone element.

4,570,743

NOISE PROTECTION DEVICE FOR A WINDING UNIT

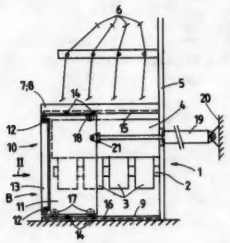
Kurt Wetter, Hagenbuch, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Sep. 10, 1984, Ser. No. 649,222

Claims priority, application Switzerland, Sep. 14, 1983, 5001/83

Int. Cl.[4] B65H *54/20*; G10K *11/00*

U.S. Cl. 181—200 4 Claims



1. A noise protection device for a winding unit of a spinning machine for processing of endless filaments, comprising:

a chuck arranged in said winding unit and holding a predetermined number of packages during a winding operation;

said winding unit defining a predetermined side laterally of and substantially parallel to said chuck;

said winding unit further defining a front side;

a noise protection door selectively assuming an initial position on said predetermined side laterally of the chuck;

said noise protection door further selectively assuming an operative position on the front side of said winding unit; and

means for pivotingly displacing said noise protection door between said initial position laterally of said chuck and said operative position on said front side of said winding unit.

4,570,744

INTAKE SILENCER FOR MARINE PROPULSION DEVICE

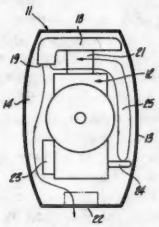
Akihiko Hoshiba, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 27, 1984, Ser. No. 655,216

Claims priority, application Japan, Sep. 29, 1983, 58-179296

Int. Cl.[4] F01N *1/02*

U.S. Cl. 181—204 4 Claims



1. An induction silencing system for an outboard motor or the like comprising a power head consisting of an internal combustion engine and a surrounding protective cowling defining a generally open volume surrounding said engine, said engine having an induction system consisting of an inlet device drawing air from said volume between the outer periphery of the engine and the inner periphery of the protective cowling, an air inlet opening for admitting external air into said volume, the improvement comprising a baffle positioned within said volume and defining a resonance chamber within the protective cowling where sounds emanating from said inlet device toward said baffle will be reflected back toward said inlet device before they can escape from said air inlet opening to the atmosphere around said protective cowling.

4,570,745

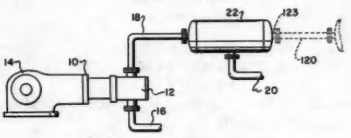
METHOD AND APPARATUS FOR MINIMIZING PULSATIONS IN FLUID TRANSMISSION SYSTEMS

Cecil R. Sparks, and Glenn Damewood, both of San Antonio, Tex., assignors to Southern Gas Association, Dallas, Tex.

Filed Mar. 2, 1984, Ser. No. 585,844

Int. Cl.[4] F01N *1/02*

U.S. Cl. 181—228 21 Claims



1. Apparatus for minimizing the transmission of acoustic pulsations in a fluid transmission system comprising:

means forming an elongated pressure vessel closed at opposite ends by opposed endwalls and forming an enclosed chamber having an acoustic length;

a first fluid conduit having means forming an opening into said chamber;

a second fluid conduit having means forming an opening into said chamber whereby fluid may be transmitted between said conduits through said pressure vessel; and

said means forming said openings of said conduits each, respectively, are disposed in said pressure vessel at substantially the maximum amplitude of a fluid particle velocity wave corresponding to a standing pressure wave of a selected resonant frequency of which said pulsations are to be minimized and said means forming said openings in said first and second conduits are each disposed so as to cause fluid flow in a direction substantially transverse to the fluid particle velocity to minimize coupling of kinetic energy between fluid in said pressure vessel and said conduits, respectively.

4,570,746

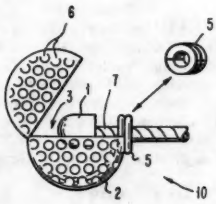
WIND/BREATH SCREEN FOR A MICROPHONE

Subrata K. Das, Granite Springs; Norman R. Dixon, Katonah, both of N.Y., and Robert F. Gluck, Bristol, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,824

Int. Cl.[4] F01N *7/00*

U.S. Cl. 181—242 6 Claims



1. A wind screen for use with a microphone element, the wind screen comprising:

a rigid perforated structure dimensioned to enclose the microphone element;

a porous material forming a layer on and surrounding said rigid perforated structure;

said layer on and surrounding said perforated structure being dimensioned to create a pad of dead air therein which, when the microphone element is enclosed, extends between said perforated structure with the porous layer thereon and the microphone element to isolate the microphone element from air turbulence outside said porous layer without substantially attenuating a speech signal directed to the microphone element from outside said porous layer;

wherein said microphone is supported by a connecting attachment through said rigid perforated structure, said connecting attachment being isolated from said rigid perforated structure by resilient means;

wherein said rigid perforated structure is a perforated plastic sphere; and

wherein said porous material is latex foam.

4,570,747

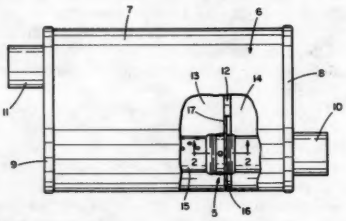
MECHANICAL LOCK JOINT FOR JOINING TUBULAR PRODUCTS

George M. Ortyl, West Chicago, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Sep. 18, 1984, Ser. No. 651,840

Int. Cl.⁴ F01N 7/18

U.S. Cl. 181—243 **3 Claims**



1. In a vehicular exhaust system muffler having a housing with a shell, end panels, at least a first internal panel, and at least a first tube and a second tube, the second tube being telescoped within the first tube, the improvement of a mechanical joint joining the first tube, the second tube and the first internal panel, the joint comprising:

a plurality of spaced, integral, annular, radially outwardly extending beads on the first tube and the telescoped second tube, a tube opening in the first internal panel, an integral, annular flange of said first internal panel adjacent the tube opening, the flange extending along the first tube and being outward of the first tube and between the beads, the first tube extending through the opening within the flange, and a plurality of integral, interlocking protrusions on the first tube and flange between the beads.

4,570,748

CO-OSCILLATING, VOLUME-CHANGING RESONATOR IN THE FORM OF A SILENCER

Michael Ghibu, Puchheim; Volker Härtel, Germering; Carl Heynemann, Taufkirchen, and Manfred Raubach, Oiching, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

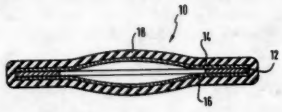
Filed May 10, 1984, Ser. No. 608,778

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317103

Int. Cl.⁴ E04B 1/82

U.S. Cl. 181—286 **5 Claims**

1. Co-oscillating, volume-changing resonator in the form of a silencer, comprising a lens-shaped housing formed of arched plates defining an evacuated cup-shaped cavity formed therein, and means for lowering the frequency of sound waves, said frequency reducing means being in the form of a coating layer completely surrounding said housing, said coating layer having a specific weight of 1 to 3.5 g/cm³, and said coating layer being



formed of an elastomer material with a Shore-A-Hardness less than 50 and a filler substance with a high specific weight as compared to said elastomer material.

4,570,749

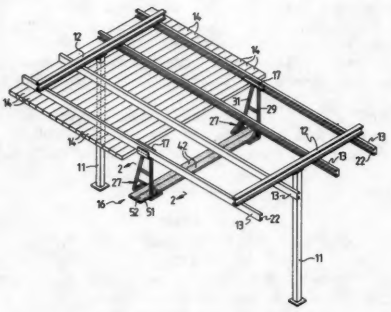
SUSPENDED SCAFFOLD

John R. McKibbin, Birmingham, Ala., assignor to Mason Corporation, Birmingham, Ala.

Filed Feb. 11, 1985, Ser. No. 700,802

Int. Cl.⁴ E04G 3/16

U.S. Cl. 182—36 **5 Claims**



1. A portable suspended scaffold for use beneath a pair of spaced apart purlins comprising:

(a) independent carriage means adapted for rolling engagement with each of said purlins with said carriage means having a plurality of circumferentially grooved rollers and a roller plate, associated with each roller, carrying at least two of said rollers in rolling engagement with said purlins;

(b) suspension means depending from said carriage means beneath each of said purlins which includes a vertical frame having an upper end connected to said roller plate and extending downwardly therefrom a predetermined distance and terminating at a lower end and a platform support carried by said lower end;

(c) a plurality of platform elements extending transversely of said purlins and removably carried by said platform support which extends perpendicular to said frame beneath said platform elements; and

(d) means for preventing disengagement of said carriage means from said purlin having safety means attached to said roller plate and detachably attached to said purlin and retaining means attached to said frame, with said safety means including an eyebolt extending from said roller plate and a flexible member connected to said eyebolt so as to loop about said purlin.

4,570,750

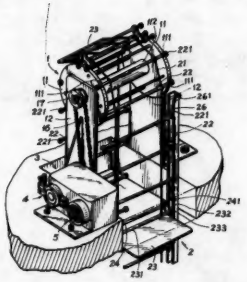
FIRE ESCAPE

Chin-Wang Tsai, P.O. Box 10160, Taipei, Taiwan

Filed May 23, 1985, Ser. No. 737,264

Int. Cl.[4] A62B *1/00*

U.S. Cl. 182—44 **3 Claims**



1. A fire escape comprising:

a wheel unit having an upper wheel rotatably mounted on the top floor and a lower wheel rotatably mounted on the bottom floor;

a descending means including two looping cables, a plurality of transverse rods each transversely fitting on the two cables and equally spaced on said cables and extending on its both ends with two rollers slidingly moved along the grooves of two guides, a plurality of platforms extending from partial said transverse rods and averagedly distributed on said cables, and two guides fitted on the passage to slidingly move said rollers formed on the two opposite ends of each said transverse rod, said transverse rods being movably engaged with a plurality of recesses formed on the perimeter of either said upper wheel or said lower wheel;

a gear box having a casing, a first gear set driven by said upper wheel by a chain, a second gear set engaged with said first gear set, and a third gear set engaged with said second gear set, said gear sets being proportionally designed to increase their speed ratio so as to greatly increase the rotation speed of said third gear set from said first gear set;

a frictional braking means driven by said first gear set; and a centrifugal braking means driven by said third gear set; the improvement comprising:

said frictional braking means including a driving disc fixed on the shaft of said first gear set and a frictional clamping collar disposed around said disc, said frictional clamping collar having an inside perimeter frictionally matching with the outside perimeter of said driving disc, said collar having an inner extension pivotedly mounted on a pin extending from said casing of said gear box and having an opening end formed with an upper lug and a lower lug spaced with an aperture therebetween, said two lugs being resiliently clamped by a resilient screw jacketed by a restoring spring so as to frictionally tighten said collar around said disc to preliminarily slacken the descending speed of said platform when loaded by weight, said upper lug being fitted with an adjusting screw of which the lower end is riding said lower lug so as to keep a specific aperture between said upper lug and said lower lug; and said centrifugal braking means including a drum casing fixed on said casing of said gear box and formed with a cylindrical recess, a rotating arm fixed on the shaft of said third gear set, two crank levers pivotedly formed on two opposite ends of said arm, two centrifugal block each coated with a rubbing pad formed on the end of each crank lever and two tension springs each tensioning two said crank levers inwards to keep a specific aperture between said block and the inside wall of said cylindrical recess, whereby said rotating arm as driven by said third gear set when sudden increase of descending speed due to heavier weight loading on said platform will be fast rotated to exert a centrifugal force to extend said two levers and centrifugal blocks to frictionally contact the inside wall of said drum casing so as to greatly reduce the rotation speed of said gear sets, said upper wheel and the descending speed of the loaded platform for safer escape in a fire accident.

4,570,751

ADJUSTABLE PLATFORM SCAFFOLDING

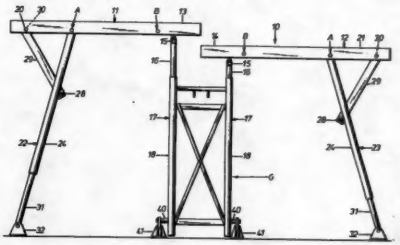
Gerhard Kleu, Worringer Str. 93, 5600 Wuppertal 1, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 709,075

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1984, 3425622

Int. Cl.[4] E04G *1/34;* **E04H** *3/10*

U.S. Cl. 182—131 **10 Claims**



1. In an adjustable scaffolding comprising a plurality of telescoping variable-height adjustable supports each having an outer pipe and an inner pipe slidably mounted inside said outer pipe and two scaffolding platforms pivotally attached to said telescoping supports with a horizontal pivot axis, each of said scaffolding platforms being swingable between an upright rest position and a horizontal working position, the improvement wherein four of said telescoping supports are provided as central supports for said scaffolding, said central supports forming corner posts for a central substantially rectangular frame supporting said scaffolding platforms, and two of said telescoping central supports are pivotally attached to each of said scaffolding platforms adjacent the other one of said scaffolding platforms, the top portions of said inner pipes of said corner posts being attached pivotally to said scaffolding platforms so that the height of each of said platforms can be independently adjusted.

4,570,752

FOLDABLE SAW HORSE

Richard E. Chapman, 804 Lancer Ct., Shorewood, Ill. 60435, and Gary V. Moyer, 807 May Ct., Channahon, Ill. 60410

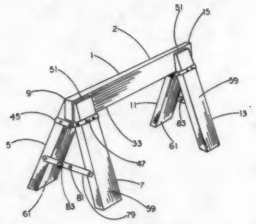
Filed Jan. 22, 1985, Ser. No. 693,905

Int. Cl.[4] F16M *11/00*

U.S. Cl. 182—155 **9 Claims**

1. A foldable saw horse, comprising a cross beam, a first pair of legs, each leg in said first pair having a solid imperforated cross-section throughout, said first pair of legs including a first right leg to the right side of said cross beam and a first left leg to the left side of said cross beam, a second pair of legs, each leg in said second pair having a solid imperforated cross-section throughout, said second pair of legs including a second right leg to the right side of said cross beam and a second left leg to the left side of said cross beam, a first separable universal pivot assembly connecting said first pair of legs to a first end region of said cross beam for first pivotal movement of said first right leg and said first left leg between a spread apart

working position and an intermediate folded position in side-by-side relationship to each other and for second pivotal movement of said first pair of legs between said intermediate folded position and a final folded position adjacent said cross beam substantially parallel therewith, a second separable universal pivot assembly connecting said second pair of legs to a second opposite end region of said cross beam for first pivotal movement of said second right leg and said second left leg between a spread apart working position and an intermediate folded position in side-by-side relationship to each other and for second pivotal movement of said second pair of legs between said intermediate folded position and a final folded position adjacent said cross beam substantially parallel therewith, said universal pivot assemblies each include a single longitudinally extending pivot pin and a single laterally extending pivot pin, said respective right and left legs of each pair being connected at their upper end region to said single longitudinally extending pivot pin of respective ones of said universal pivot assemblies for said first pivotal movement, including means to so connect said legs of each pair to said single longitudinally extending pivot pin of respective ones of said universal pivot



assemblies, said single longitudinally extending pivot pin of each of said pivot assemblies being positioned under said cross beam and including a first end facing inwardly of said cross beam and toward each other, said single laterally extending pivot pin of each of said pivot assemblies being connected to said first end of respective ones of said single longitudinally extending pivot pins of each of said pivot assemblies for said second pivotal movement, including means to so connect said single laterally extending pivot pin of each of said pivot assemblies to said first end of respective ones of said single longitudinally extending pivot pins of each of said pivot assemblies, and means to connect said single laterally extending pivot pin of each of said pivot assemblies to said cross beam, the structure comprising said single longitudinally extending pivot pin under said cross beam connected to said upper end region of said right and left legs and pivotally connected at its inwardly facing first end to said laterally extending pivot pin bears against the underside of said cross beam when said pairs of legs are pivoted in said second pivotal movement from said final folded position to said intermediate folded and spread apart working position to prevent further pivotal movement beyond said intermediate folded and working positions.

4,570,753

ELEVATOR HOISTING DEVICE

Kazutoshi Ohta, and Katsuhiko Suzuki, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,458
Claims priority, application Japan, Oct. 4, 1982, 57-174142
Int. Cl.[4] B66B 9/00
U.S. Cl. 187—1 R **4 Claims**

1. An elevator hoisting device, comprising

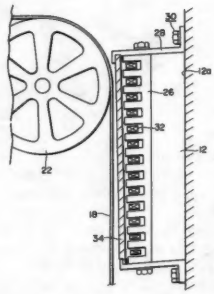
a linear motor having a stator for being disposed on the side of a building and forming the primary side of said motor;

an elevator car;

a counterweight;

at least one longitudinally extending tape-shaped metallic member, continuously flexible all along its length, connected at opposite ends thereof to said elevator car and said counterweight; and

means for engaging said member intermediate said opposite ends at a location above said elevator car and said counterweight so as to vertically support said member, said elevator car and said counterweight, said member being movable longitudinally with respect to said means so as to move said elevator car and counterweight in opposite vertical directions therewith, the portion of said member between said location and said counterweight being located close to said stator so as to be vertically driven by magnetic forces from said stator, whereby said portion functions as a secondary electrical conductor of said linear motor;



said elevator car and said counterweight being movable with said member between first positions in which said elevator care is adjacent said engaging means and said counterweight is substantially below said engaging means, and second positions in which said counterweight is adjacent said engaging means and said elevator car is substantially below said engaging means, said stator being located adjacent said engaging means so as to oppose said portion when said elevator car and said counterweight are in either of said first positions and said second positions;

said portion of said member including a vertically extending uppermost part, said stator having a front face opposing said uppermost part and tilted downwardly and away from said uppermost part.

4,570,754

ELEVATOR CAB WITH RETRACTABLE BUTTONS FOR PROTECTIVE PADS

Karl B. Orndorff, Bonneauville Boro, and Edward F. Sherwood, Gettysburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1984, Ser. No. 666,692
Int. Cl.[4] B66B 9/00
U.S. Cl. 187—1 R **8 Claims**

1. An elevator cab, comprising:

a platform,

upstanding wall members on said platform having first surfaces which define the inside of the cab, second surfaces outside the cab and upper horizontally extending edges,

said upstanding wall members defining a plurality of openings disposed in spaced relation near their upper edges,

and a pad button disposed in each of said openings,

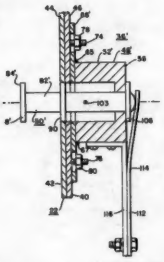
each of said pad buttons including a shaft having first and second ends, a head portion at said first end, and a support portion intermediate said first and second ends,

said head and intermediate portions having diameters sized to slidably enter the associated opening,

said pad button being operable between advanced and retracted positions,

said head portion defining a surface which is flush with the

first surface of its associated side wall portion when in the retracted position, with the remaining portion of said pad button extending outwardly from the associated second surface,



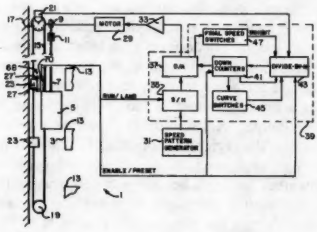
said head portion extending into the cab, in the advanced position of the pad button, with said intermediate support portion entering the associated opening to transfer load applied near the first end of the shaft to the associated wall portion.

4,570,755

DIGITAL LANDING COMPUTER FOR ELEVATOR

George C. Tsai, Louisville, and Svend J. Bentsen, Crestwood, both of Ky., assignors to Armor Electric Company, Inc., Louisville, Ky.

Filed Jun. 27, 1983, Ser. No. 508,284
Int. Cl.[4] B66B *1/30*
U.S. Cl. 187—29 R **22 Claims**



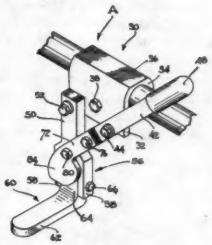
22. In a method of controlling the movement and landing of an elevator car operated by a motive system, said method comprising applying a variable speed running signal to said motive system in accordance with a pre-established running signal program, said running signal program including a deceleration program for decelerating said car as it approaches a landing floor, sensing the arrival of said car at a position a fixed distance from a landing floor, and thereafter controlling the landing of said car at the landing floor, the improvement comprising controlling substantially the entire landing of said car as a function of the instantaneous value of said running signal applied in accordance with said pre-established running signal program when said car arrives at said position a fixed distance from said landing floor.

4,570,756

BRAKE DEVICE FOR WHEELCHAIRS

Jeffrey P. Minnebraker, Van Nuys, and George E. Linder, Pacific Palisades, both of Calif., assignors to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Filed Sep. 30, 1983, Ser. No. 537,943
Int. Cl.[4] B60T *1/04*
U.S. Cl. 188—2 F **23 Claims**



1. A wheel brake device for use with a wheelchair, said brake device comprising:

(a) brake mounting means for mounting the brake device to a frame of a wheelchair,

(b) a brake arm pivotally mounted with respect to said mounting means and capable of being pivotally moveable with respect thereto from a wheel locking position to a non-locking position,

(c) a wheel engaging tab carried by said brake arm and capable of engaging a wheel of a wheelchair in a wheel engaging position to prevent rotation of same when said brake arm is in a locking position and not engaging said wheel when the brake are is in a non-locking position, said wheel engaging tab having a flange thereon which is angularly disposed to the tab and which is moveable therewith and which angularly disposed flange has a cam receiving surface thereon,

(d) pivot means coupling said tab to said brake arm so that said tab can be shifted to a first position where it is generally perpendicularly disposed to the plane of rotation of the wheel and capable of being engageable with the wheel when the brake arm is shifted to the wheel locking position, and to a second, non-interferring position in which said tab is located in a plane where it is generally parallel to and displaced from the plane of rotation of the wheel and cannot engage said wheel and is not likely to be contracted by a hand of a user when the brake arm is in the wheel locking position,

(e) lever means operatively coupled to said brake arm and capable of being manually engaged for shifting said brake arm between the wheel locking position and the non-locking position, and

(f) a cam on the end of said lever means and engaging said cam receiving surface of said flange on the tab to force said tab into the wheel engaging position when the brake arm is moved to the locking position and enabling said locking tab to be moved to the non-interfering position when said brake arm is moved to the non-locking position.

4,570,757

DEVICE FOR LOCKING A SLIDABLE MEMBER

Joseph H. Marzullo, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 24, 1984, Ser. No. 643,992
Int. Cl.[4] B65H *59/10*
U.S. Cl. 188—67 **3 Claims**

1. A device for locking a slidable member, comprising:

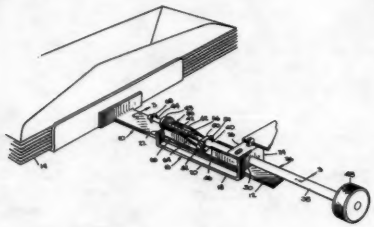
a U-shaped bracket having a central section and a pair of legs extending upwardly from each end of the central section,

each of said legs having a lower aperture adjacent the central section and an upper, circular aperture spaced from said lower aperture;

a lockable sliding member slidably mounted in said lower apertures;

a threaded spindle rotatably mounted in the circular apertures, said spindle having a large diameter portion and a small diameter portion, said small diameter portion having a central threaded section for threaded engagement with one of said circular apertures and unthreaded end portions, said large diameter portion having a knob at its exterior end;

a yoke rotatably mounted on the unthreaded portion of said threaded spindle adjacent the large diameter portion, said yoke having a pair of camming posts extending outwardly therefrom perpendicular to the axis of said threaded spindle; and



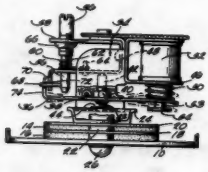
a U-shaped cam follower member situated between said legs of said U-shaped bracket, said cam follower member having a median section contiguous with said lockable, sliding member and a pair of flanges extending upwardly from said median section, each of said flanges having a camming surface inclined downwardly in the direction of said spindle knob for camming engagement with said camming posts, wherein rotation of said knob in one direction causes said camming posts to be moved in a direction away from said knob by engagement of said yoke with said large diameter portion to thereby create downward pressure on said cam follower member and said median section against said sliding member; and to lock said sliding member against said central section to prevent any movement therebetween.

4,570,758

MANUAL CONTROL FOR RELEASABLY HOLDING A SPRING APPLIED/ELECTRICALLY RELEASED BRAKE DISENGAGED

Wayne D. Hendricks, Mukwonago, Wis., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Jun. 20, 1983, Ser. No. 505,878
Int. Cl.⁴ B60T *13/04*
U.S. Cl. 188—72.3 **24 Claims**



5. A brake apparatus comprising

a frame,

braking means including a brake mounted on said frame, and a lever pivotally mounted on said frame and being engageable with said brake, said lever being selectively and alternatively movable between a set position wherein said brake is set, and a release position wherein said brake is released,

a lever spring biasing said lever to said set position,

a plunger having axial and rotational modes of movement and wherein in one mode of movement said plunger is operable as deadman means to hold said lever in said release position so long as force is maintained on said plunger, and in the other mode of movement said plunger is operable as latch means to hold said lever in said release position in response to said other mode of movement and to hold said lever in said release position after the force thereon is removed, and

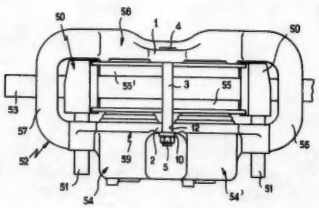
means for releasing said plunger from said lever so that said lever returns to said set position.

4,570,759

DISC BRAKE WITH CALIPER HAVING RELEASABLY LOCKABLE REINFORCEMENTS

Joaquim Ferret Bofill, Barcelona, and Josep Para Joan, Llissa de Munt, both of Spain, assignors to Bendiberica S.A., Barcelona, Spain

Filed Dec. 21, 1983, Ser. No. 564,067
Claims priority, application Spain, Dec. 27, 1982, 519,068
Int. Cl.⁴ F16D *55/00*
U.S. Cl. 188—73.32 **6 Claims**



1. A disc brake comprising a caliper slidingly mounted on a fixed support and carrying a brake actuator operable to bring two friction elements into frictional engagement with the opposite surfaces of a disc rotatable around an axis, the caliper forming a frame positioned around the fixed support and including first and second portions on both sides, axially, of said disc, and at least one tubular reinforcing member straddling said disc and said friction elements and releasably interconnecting under a predetermined tension said first and second portions of said caliper, said reinforcing member extending, in operative position, through a first opening in said first portion and through a second opening in said second portion, said reinforcing member having a headed end cooperating in bearing engagement with a corresponding surface of said first portion into which opens axially said first opening in the form of an axially extending through bore of dimension greater than that of said reinforcing member and smaller than said headed end, and, opposite said headed end, a threaded end portion protruding outwardly axially from said second opening and onto which is screwed and locked in a determined position a tightening nut, said second opening being in the form of an open slot opening axially, in the direction opposite to said first opening, into a flat bearing surface of said second portion, a radially releasable spacer means of determined thickness interposed between said bearing surface of said second portion and said nut, said first opening having a transverse dimension greater than the transverse dimension of a connection zone of said tubular reinforcing member with said headed end so as to permit said threaded end with its locked nut to be disengaged from said slot by pivoting when said spacer means is removed.

4,570,760

APPARATUS FOR SEALING THE GUIDE PIN OF A FLOATING-CALIPER SPOT-TYPE DISC BRAKE

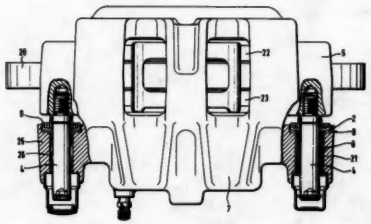
Herbert Schmidt, Frankfurt-Unter-Liederbach, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,092

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243851

Int. Cl.[4] F16D *65/09*

U.S. Cl. 188—73.44 6 Claims



1. Apparatus for sealing the guide pin of a floating-caliper spot-type brake, in which the guide pin is fastened both to the brake carrier member and to the brake caliper member and is slidably received in an opening of the brake caliper and in which there is a sealing boot retained at the open rim of an opening in the brake caliper at one end of the boot and tightly embracing the pin at the other end, said boot comprising a bellows portion which interconnects both said ends, the invention in which the other end of the sealing boot which embraces the pin has a hollow cylindrical shape and is furnished with an annular groove on its internal surface, and in which an end portion of the internal surface of the other end of the sealing boot adjacent said annular groove forms a sealing lip which abuts against the pin, said other end of the sealing boot having a hollow cylindrical shape containing a crown spring partly enclosed by the material of the sealing boot, a collar of said spring located concentrically with the pin and being retained in an annular groove of the pin to secure the other end of the sealing boot against an axial shift.

4,570,761

CABLING STRUCTURE OF PARKING CABLES FOR DRUM BRAKES

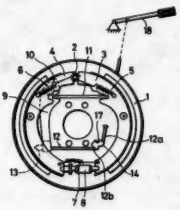
Takashi Inoue, Hanyu, Japan, assignor to Akebono Brake Industry Company Ltd., Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,267

Claims priority, application Japan, Jul. 18, 1983, 58-110144[U]

Int. Cl.[4] F16D *51/22*

U.S. Cl. 188—78 5 Claims



1. A cabling structure of a parking cable for a brake mechanism including a drum brake having a backing plate, a brake shoe and a parking lever, comprising:

means for increasing mechanical advantage in the cabling structure between the parking lever and the brake shoe including a pulley supported by said brake mechanism for swinging movement about an axis and having two arcuate grooves having different radii measured from said axis thereof; and

first and second independent cables slidably received in the two arcuate grooves of said pulley, respectively, and having terminal ends releasably connected to said pulley and cable portions extending to said brake actuating mechanism and said parking lever, respectively, so that the direction of leading out said parking cable may be different from the direction of leading in said parking cable to the pulley.

4,570,762

CAGE FOR A ROLLER BRAKE FREEWHEEL

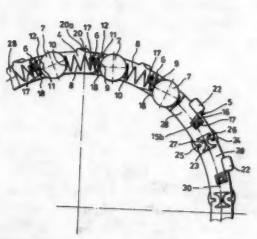
Horst Husmann, Gifhorn, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,557

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333130

Int. Cl.[4] F16D *15/00*

U.S. Cl. 188—82.84 14 Claims



1. A cage for a roller brake freewheel comprising two annular members forming the side walls of the cage, a plurality of connecting webs extending transversely between the side walls to join them and to form a plurality of chambers distributed about the circumference of the cage to accommodate corresponding brake rollers and springs, and at least one resilient portion formed in each of the annular members to facilitate elastic yielding in the direction of the circumference of the cage.

4,570,763

TRUCK MOUNTED AIR CYLINDER AND SLACK ADJUSTER

Henry R. Billeter, deceased, late of Marco Island, Fla. (by Lucille Billeter, administratrix), assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Aug. 19, 1983, Ser. No. 524,743

Int. Cl.[4] F16D *65/74*

U.S. Cl. 188—196 D 6 Claims

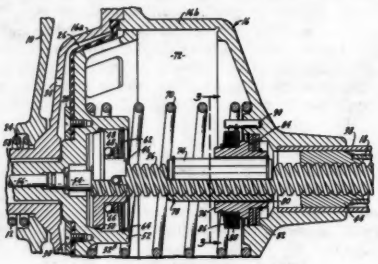
1. A truck mounted air cylinder and slack adjuster including an elongated brake operating member, an air cylinder, a threaded rod attached to said brake operating member and extending into said air cylinder,

a drive member positioned within said air cylinder and in sealing relationship with the wall thereof, said drive member moving within said cylinder in response to air pressure applied thereto,

clutch means connecting said threaded rod to said drive member for concurrent axial movement therewith, said clutch means providing for rotation of said rod relative to said drive member,

and slack adjusting means associated with said cylinder and rod and including a friction clutch coaxially mounted about said threaded rod, a collar threadedly mounted

upon said threaded rod and movable both concurrently with and relative to said threaded rod, and a second collar mounted upon said first collar and peripherally supporting said friction clutch, said first collar being axially movable relative to said second collar, but being attached for simul-



taneous rotary movement relative to said threaded rod, said slack adjusting means cooperating with said clutch means to extend said rod relative to said elongated brake operating member in response to a slack condition sensed by said slack adjusting means during a brake application.

4,570,764

DAMPER APPARATUS IN CLUTCH FOR TORQUE CONVERTOR

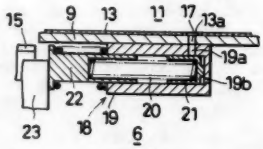
Sadanori Nishimura, Omiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,362

Claims priority, application Japan, Jul. 24, 1982, 57-111614[U]

Int. Cl.[3] **F16H** *45/02;* **F16D** *33/12*

U.S. Cl. 192—3.29 **2 Claims**



1. A damper apparatus in a clutch for a torque convertor, the torque convertor including an input casing connected to an input shaft, a pump blade wheel, the pump blade wheel and the input casing defining therebetween an internal space, a turbine blade wheel in the internal space and connected to an output shaft, and a clutch plate interposed between the turbine blade wheel and the input casing, the clutch plate being axially movable to be engaged with or disengaged from the input casing according to a difference between fluid pressures acting on both side surfaces thereof; the damper spring means interconnecting the clutch plate and the turbine blade wheel for relative turning therebetween, the clutch plate having a communication hole therein for communicating between both side surfaces thereof, and an opening and closing member for opening and closing the communication hole; characterized in that the opening and closing member comprises a pressure regulating valve having a set pressure for opening and closing and means for adjusting the set pressure in accordance with an amount of relative turning displacement between the clutch plate and the turbine blade wheel.

4,570,765

GEARSHIFT SYSTEM FOR AN AUTOMOBILE

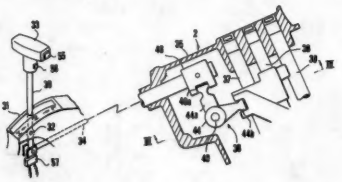
Fujio Makita, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 524,948

Claims priority, application Japan, Aug. 31, 1982, 57-151366

Int. Cl.[4] **B60K** *20/16, 41/22;* **F16D** *37/02;* **F16H** *3/08*

U.S. Cl. 192—3.56 **8 Claims**



1. A gearshift system for an automobile with an automatic clutch and a transmission having four forward-gear sets which are divided into two low speed gears and two high speed gears, comprising:

a first synchronizing device for selectively engaging a one of said low speed gears and one of said high speed gears with an output shaft of said transmission;

a second synchronizing device for selectively engaging the other low speed gear and the other high speed gear with said output shaft;

a first shifter means for operating said first synchronizing device;

a second shifter means for operating said second synchronizing device;

a select lever adapted to engage one of said first and second shifter means;

a manually operated shift lever;

means for transmitting the shift of said shift lever to said select lever for shifting one of said shifter means;

an electrical select device for operating said select lever means to engage with one of said shifter means;

switch means for producing signals representing a selection of one of said synchronizing devices; and

control circuit means responsive to said signals for operating said electrical select device to select one of said synchronizing devices.

4,570,766

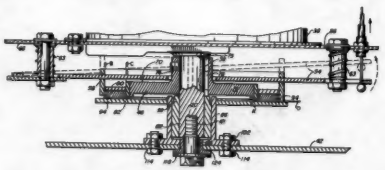
MAGNETIC CLUTCH-BRAKE MECHANISM

Gary L. Golobay, 1215 Helen, Augusta, Kans. 67010

Filed Mar. 16, 1983, Ser. No. 475,730

Int. Cl.[4] **A01D** *69/08, 69/10;* **F16D** *67/02*

U.S. Cl. 192—18 R **15 Claims**



1. A coupling device using magnetic flux to selectively couple and brake members having relative rotation about an axis, comprising:

(a) a rotatable drive member having a drive rotor assembly secured thereto;

(b) a clutch plate assembly rotatably connected to said drive member and operably associated with said drive rotor assembly;

(c) said clutch plate assembly having a magnetic field assembly mounted on a collector member creating a magnetic flux field within itself and said rotor assembly;

(d) a main actuator assembly having an actuator ring member mounted about said clutch plate assembly and moveable axially relative thereto;

(e) said actuator ring member in a brake mode when engaging said clutch plate assembly and a larger magnetic flux field is created between said actuator ring member and said magnetic field assembly to prevent rotation of said clutch plate assembly; and

(f) said actuator ring member in a clutch mode is disengaged from said collector member and a magnetic flux field is created between said drive rotor assembly and said magnetic field assembly to cause rotation of said clutch plate assembly.

4,570,767

ELECTROMAGNETIC CLUTCH/BRAKE DEVICE

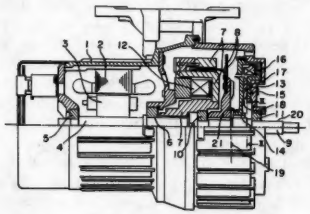
Hiroshi Kumatani, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1983, Ser. No. 487,470

Claims priority, application Japan, Apr. 28, 1982, 57-62381[U]

Int. Cl.⁴ F16D *67/06*

U.S. Cl. 192—18 B **6 Claims**



1. An electromagnetic clutch/brake device comprising:

a fixed housing;

a rotatable driving body in said housing;

means for rotatably driving said driving body;

a driven clutch body in said housing and facing said driving body, said driven body being fixed to an output shaft rotatable about an axis;

electromagnetic clutch means for selectively rotatably coupling said driving and driven bodies;

a rotary brake element mounted on said output shaft by a spline connection permitting substantially only axial relative motion of said brake element and said output shaft;

a fixed brake element fixed to said housing and facing said rotary brake element;

electromagnetic brake means for selectively coupling said rotary and fixed brake elements;

means mounted on said rotary brake element for unbalancing said rotary brake element about said axis by an amount sufficient that when said rotatable brake element is rotated by said means for rotatably driving, said rotary brake element is pressed against said output shaft at said spline connection to prevent rattling; and

means mounted on said driven body for unbalancing said driven body, said means for unbalancing said rotary brake element and said means for unbalancing said driven body being mutually symmetrically positioned with respect to said output shaft, said means for unbalancing said driven body comprising means for unbalancing said driven body by a degree sufficient such that an assembly of said rotary brake element, said output shaft and said driven body is balanced.

4,570,768

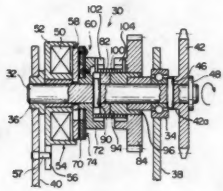
ELECTROMAGNETICALLY CONTROLLED SPRING CLUTCH MECHANISM

Kouzou Nishimura, Akashi, and Kazumi Iida, Matsubara, both of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Sep. 21, 1984, Ser. No. 653,183

Int. Cl.⁴ F16D *13/08, 27/10*

U.S. Cl. 192—35 **8 Claims**



1. An electromagnetically controlled spring clutch mechanism for selectively connecting drivingly a first rotating element and a second rotating element one of which constitutes an input rotating element to be rotated in a predetermined direction and the other of which constitutes an output rotating element, said mechanism comprising:

a rotating shaft to which the first rotating element is fixed and on which the second rotating element is mounted rotatably,

a rotor adapted to be rotated as a unit with the rotating shaft,

an armature assembly disposed on one side of the rotor and including an armature member positioned opposite to one surface of the rotor, a supporting member mounted rotatably on the rotating shaft and a biasing spring member disposed between the supporting member and the armature member for elastically biasing the armature member in a direction away from said one surface of the rotor,

an electromagnetic means adapted when energized to attract magnetically the armature member to said one surface of the rotor against the elastic biasing action of the biasing spring member,

a first boss member adapted to rotate as a unit with the rotating shaft,

a second boss member disposed adjacent to the first boss member and adapted to rotate as a unit with the second rotating element, and

a coil spring means received about, and spanning, the first and second boss members and connected to the armature assembly at one end and to the second rotating element at the other end, said coil spring means being wound from said one end to said other end in a direction in which said coil spring means contracts when the armature assembly and the second rotating element are rotated relative to each other incident to the rotation of said input rotating element in said predetermined direction.

4,570,769

RATCHET MECHANISM

Akihiko Isaka, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Nov. 1, 1982, Ser. No. 438,188

Claims priority, application Japan, Nov. 26, 1981, 56-189832; Jan. 14, 1982, 57-3504[U]; Jun. 21, 1982, 57-92869[U]

Int. Cl.⁴ F16D *11/00, 41/12*

U.S. Cl. 192—46 **3 Claims**

1. A ratchet mechanism comprising a first rotatable member made of synthetic resin and a second rotatable mounted coaxially with said first rotatable member, either one of said first and second rotatable members having a plurality of U-shaped resilient engagement arms made of synthetic resin angularly spaced at equal angular intervals and having engaging portions, the other of said rotatable members having a plurality of teeth angularly spaced at equal angular intervals and engage-

able with said engaging portions of said engagement arms when said first and second rotatable members rotate together in a first direction, said teeth deflecting said engagement arms when said first and second rotatable members rotate relative to each other opposite said first direction, a bent portion of said

U-shaped arms contacting a periphery of said one of said rotatable members opposed to said teeth when said first and second rotatable members rotate together in said first direction and said teeth engage said engaging portions of said contacting arms.

4,570,770

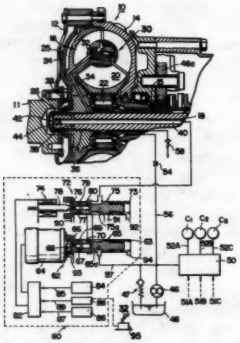
CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS FOR VEHICLES

Masao Nishikawa, Tokyo; Shinzo Sakai, Kamifukuoka, and Takashi Aoki, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 547,195

Int. Cl.⁴ B60K *45/02, 41/28*

U.S. Cl. 192—0.052 **14 Claims**



1. A control system for an automatic transmission for a vehicle with a vehicle speed detector providing an electrical vehicle speed signal and a hydraulic pressure source for supplying a predetermined hydraulic pressure, the automatic transmission including a hydraulic torque converter having an input and an output shaft, comprising:

a signal processing circuit for processing the electrical vehicle speed signal and generating an electrical control signal;

an electro-magnetic valve means, interposed between the hydraulic pressure source and the torque converter, for converting the predetermined hydraulic pressure into a plurality of levels in response to said control signal to produce the control pressure; and

a coupling means for providing a direct mechanical coupling between the input and output shafts in response to said control pressure and with the degree of coupling being in proportion to the magnitude of said pressure.

4,570,771

VISCOUS FLUID COUPLING HAVING CENTRIFUGAL VALVE MEANS

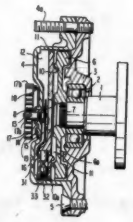
Hiorji Yamaguchi, Kariya; Takanobu Hori, and Masaharu Hayashi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 30, 1982, Ser. No. 445,602

Claims priority, application Japan, Nov. 30, 1981, 56-178154[U]; Nov. 30, 1981, 192487

Int. Cl.⁴ F16D *35/00, 43/25, 43/04*

U.S. Cl. 192—58 B **3 Claims**



1. A viscous fluid coupling comprising a drive shaft, hollow casing means rotatably supported on said drive shaft, plate means dividing the interior of said hollow casing means into a fluid reservoir chamber and a fluid operating chamber, a rotor secured for rotation with said drive shaft and located within said fluid operating chamber, passage means extending through said plate means in communication with said operating chamber and said reservoir chamber, a first valve member operatively associated with said passage means for controlling fluid transmission from said fluid reservoir chamber into said fluid operating chamber, temperature responsive bimetal means located outside of said casing means and operatively connected to said first valve member for moving said first valve member in response to changes in temperature, a second valve means operatively associated with said passage means for additionally controlling fluid transmission from said fluid reservoir chamber into said fluid operating chamber in response to centrifugal force generated by the rotation of said casing means, spring means normally biasing said second valve means into a position to prevent the transmission of fluid through said passage means in the absence of centrifugal force and an additional passage means extending through said plate means, said second valve means including a radially disposed piston valve having a first valve portion for controlling fluid transmission from said reservoir chamber into said operating chamber through said passage means and an additional valve portion operatively associated with said additional passage means to control the passage of fluid through said additional passage means.

4,570,772

CLUTCH WITH REACTION PLATE IN TWO PARTS, ESPECIALLY FOR MOTOR VEHICLES

Jacques Alas, Enghien, and Michel Bacher, Domont, both of France, assignors to Valeo, Paris, France

Filed Feb. 7, 1984, Ser. No. 577,779

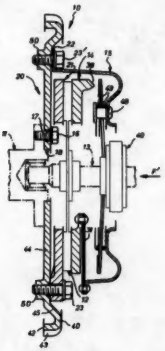
Claims priority, application France, Feb. 8, 1983, 83 01934

Int. Cl.⁴ F16D *13/18*

U.S. Cl. 192—70.18 **5 Claims**

1. A reaction plate assembly for a friction clutch, said reaction plate assembly having an axis and comprising two parts including a one-piece support bracket in the form of a sheet metal stamping including a radially extending central portion having means for securement to a driving shaft and an axial rim

defining a toothed starter ring for rotating said support bracket; a separate reaction element for engaging a clutch plate



in clamping reaction; and means for rigidly fixing said reaction element to said support bracket.

4,570,773

ANTIFRICTION-BEARING THROWOUT, PARTICULARLY FOR AUTOMOTIVE CLUTCHES

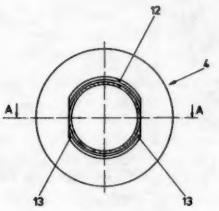
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,440

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116168

Int. Cl.⁴ F16D *23/14*

U.S. Cl. 192—98 **14 Claims**



1. In an antifriction-bearing clutch release assembly, including a sliding sleeve having a thrust plate and a clutch bearing including a non-rotating bearing-ring, the non-rotating ring of said clutch bearing abutting said thrust plate in a radially slidable manner; the improvement comprising means for mounting said non-rotating bearing ring on said sliding sleeve and frictionally opposing relative rotation therebetween, whereby said non-rotating bearing-ring can rotate in a circumferential direction with respect to said sliding sleeve for substantially all circumferential displacement therebetween upon overcoming said friction opposition, and further comprising a pair of parallel guide surfaces positioned to enable said non-rotating bearing-ring to slide in a radial direction with respect to said sliding sleeve parallel to said guide surfaces.

4,570,774

TORSION DAMPING DEVICE, ESPECIALLY A CLUTCH PLATE FOR A MOTOR VEHICLE

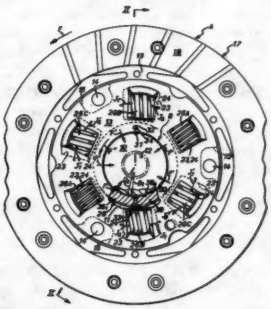
Pierre Loizeau, Ville D'Avray, France, assignor to Valeo, Paris, France

Filed Aug. 11, 1983, Ser. No. 522,358

Claims priority, application France, Aug. 13, 1982, 82 14122

Int. Cl.⁴ F16D *3/14*

U.S. Cl. 192—106.2 **14 Claims**



1. A torsion damping device, in particular for a clutch plate assembly, said torsion damping device comprising at least two coaxial rotary parts mounted for relative angular movement within a predetermined range, elastic means circumferentially interposed between said coaxial parts, friction means operatively disposed axially between said coaxial parts, said friction means comprising at least one annular component having an axial bearing surface, one of said rotary parts having an axial bearing surface engageable with said axial bearing surface on said annular component, engagement means for connecting said annular component for rotation with the other of said rotary parts for at least part of said predetermined range of relative angular movement in at least one direction of rotation, said annular component being a circumferentially split annular component, said split annular component being constantly biased radially against the axial bearing surface on said one rotary part.

4,570,775

CLUTCH PLATE ASSEMBLY WITH IMPROVED COUPLING BETWEEN A HUB AND A FRICTION DISC THEREOF

André Caray, Paris, and Pierre Renaud, Le Plessis-Trevise, both of France, assignors to Valeo, Paris, France

Filed Sep. 30, 1982, Ser. No. 428,602

Claims priority, application France, Oct. 14, 1981, 81 19298

Int. Cl.⁴ F16D *3/66*

U.S. Cl. 192—106.2 **10 Claims**

1. A clutch plate assembly for motor vehicles, said clutch plate assembly comprising two coaxial parts mounted for rela-

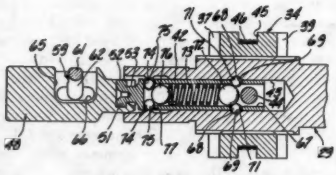
tive rotation within a predetermined range of angular displacement against the action of resilient means, one of said coaxial parts comprising a hub flange and the second coaxial part comprising two annular guide members disposed on axially opposite sides of the hub flange, and an axial ring fixed along one edge to the periphery of a first of said guide members in axially extending relation and having a free edge remote from said first guide member, said axial ring being disposed radially outwardly of said hub flange, the second of said guide members having circumferentially spaced tenons engaged and crimped in notches in said axial ring, said hub flange having along its periphery circumferentially spaced lugs normally received with clearance in recesses in said axial ring, the improvement wherein said recesses in said axial ring are circumferentially offset relative to said notches therein, axially extending portions of the free edge of said axial ring in axial alignment with said recesses lying along a circumference having a diameter greater than that part of said axial ring adjoining said first guide member, and said axially extending portions being spaced radially outwardly from said axial ring part.

4,570,776

DETENT MECHANISM FOR CLUTCHES

Takashi Iwashita, Hamakita; Hideo Suzuki, Shizuoka, and Ryoji Nakahama, Iwata, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 13, 1983, Ser. No. 503,570
Claims priority, application Japan, Jul. 9, 1982, 57-118661
Int. Cl.⁴ G05G *5/06*
U.S. Cl. 192—114 R **32 Claims**



1. A detent mechanism for dog clutches or the like comprising a first member and a second member juxtaposed to each other and supported for relative movement, said first member having a detent recess adapted to be engaged by a detent, a first detent carried by said second member and biased to engage said recess for releasably restraining said members against relative movement, said first member further having a cam surface formed thereon spaced from said detent recess, and a second detent carried by said second member and biased to engage said cam surface for applying a thrust to effect relative movement between said members, the means for biasing the first and second detents comprising a common spring.

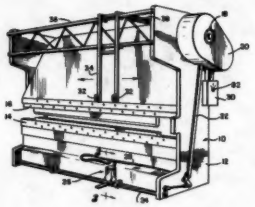
4,570,777

TREADLE CONTROL

Donald R. Armstrong, Carmel, Ind., assignor to Hugh J. Baker and Company, Indianapolis, Ind.

Filed Oct. 5, 1983, Ser. No. 539,340
Int. Cl.⁴ F16D *11/00*
U.S. Cl. 192—134 **12 Claims**

1. A control for a treadle activated machine tool having power means for powering the operation of the tool, a treadle, and mechanical treadle linkage connecting the treadle to the power means for causing actuation of the machine tool upon application of a force to the treadle, the control comprising at least one sensor means for sensing the presence of an operator's hand remote from a work area of the machine tool and interrupt means for selectively interrupting the treadle linkage in



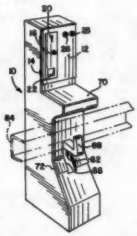
response to a signal from the sensor indicating the absence of the operator's hand from the sensor means.

4,570,778

VEHICLE SECURITY APPARATUS

Edward N. Daniels, 1961 Delaware St., Gary, Ind. 46407

Filed Aug. 22, 1983, Ser. No. 524,906
Int. Cl.⁴ G07F *5/10, 17/10*
U.S. Cl. 194—239 **3 Claims**

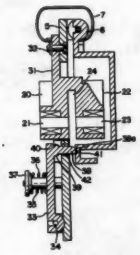


1. An apparatus for securing a vehicle parked in a selected position to prevent the theft thereof including a stanchion, a bumper-engaging arm pivotally connected to said stanchion, said arm including a first portion adapted to project outwardly of the stanchion toward a vehicle, and an extension on said arm which extends upwardly when said arm extends outwardly, said extension being adapted to fit behind the bumper of a vehicle when the vehicle is parked adjacent the stanchion, drive means for said arm for driving the arm between an inoperative position and an operative position where the arm extends outwardly, and coin-operated means for energizing said drive means, and including a lock and key, an electrical circuit for energizing said drive means, a contact arm associated with said lock whereby turning of said key causes said contact arm to complete said circuit to energize said drive means, the presence of a coin in the apparatus permitting turning of said key, and wherein said stanchion includes a recessed portion for receiving said bumper, an opening defined by the stanchion in the portion thereof including said recessed portion, said arm extending through said opening when in the operative position, and said recessed portion defining a shoulder extending over a bumper received in the recessed portion preventing lifting of the vehicle off said arm.

4,570,779
COIN SORTING DEVICE

Hiroshi Abe, Kodaira, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,338
Claims priority, application Japan, May 11, 1982, 57-77582
Int. Cl.[4] G07D 5/08
U.S. Cl. 194—318 2 Claims



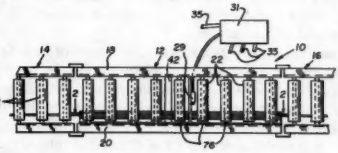
1. A coin sorting device comprising:
a stationary side plate;
a movable side plate openably connected at the upper side thereof to and spaced sidewardly from said stationary side plate to define a coin sorting passage therebetween;
at least one set of transmitting and receiving coils positioned in alignment with each other at the opposite sides of the coin sorting passage, respectively, for detecting a load impedance of a coin;
a stationary retainer frame for mounting both of said transmitting coil and said receiving coil in fixed relation in order to maintain a predetermined distance between said coils; and
a track for running a coin through said coin sorting passage between said coils which is adapted to retract sideways out of said coin sorting passage to downwardly open the passage so that a coin stopped in said passage between said coils falls therefrom to remove a coin stopped therein;
said track being provided on a track portion projecting laterally from the upper end of a plate member which is hinged at a lower end to said stationary side plate and is urged by means of a spring so as to extend said track portion through an opening in said stationary side plate to position said track in said coin sorting passage;
said track portion having a tapered shoulder, while said stationary side plate contains a seat for said tapered shoulder so as to position said track in said coin sorting passage.

4,570,780
PROPELLING AND BRAKING APPARATUS FOR A ZERO PRESSURE ACCUMULATOR

John A. Thwaites, Jackson, N.J.; Hyman Miller, Brooklyn, N.Y., and Ronald A. Ferrara, Manalapan, N.J., assignors to Contran Conveyors & Systems, Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 377,694, May 13, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,426
The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.
Int. Cl.[4] B65G 13/06
U.S. Cl. 198—781 3 Claims

1. A zero pressure accumulator conveyor comprising:
(a) a plurality of sections arranged in tandem, each section including a pair of side rails and a plurality of article supporting rollers at spaced intervals therebetween;
(b) driving means disposed between said side rails including:
(i) mounting means affixed to one of said side rails beneath said article supporting rollers,
(ii) driven belt means normally biased into intimate contact with a plurality of said supporting rollers,
(iii) first U-shaped bracket means resiliently coupled to said mounting means, the arm portions of said first U-shaped bracket means being provided with apertures and extending upwardly towards said article supporting rollers,
(iv) second U-shaped bracket means disposed within the opening of said first U-shaped bracket means and facing in the same direction, the arm portions of said second U-shaped bracket means being provided with elongated apertures and having braking means disposed on the distal end of at least one arm thereof,
(v) roller means having an axle which is rotatably received by said apertures and said elongated apertures, said roller means being operatively coupled to and in intimate contact with said driven belt means, and

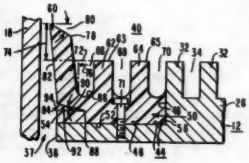


(vi) expansible tube means disposed between the horizontal portions of said first and second U-shaped bracket means and adapted to be operatively coupled to an article detecting sensor and a pressurized fluid source, said expansible tube means causing said braking means to engage a plurality of said article supporting rollers and remove said driven belt means from contact with said supporting rollers when fluid is permitted to enter said expansible tube means by said article detecting sensor that controls the ingress and egress of fluid to said expansible tube means, said sensor being activated by an article moving along said conveyor.

4,570,781
ESCALATOR

George A. Kappenhagen, Stroudsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1984, Ser. No. 607,096
Int. Cl.[4] B66B 23/12
U.S. Cl. 198—333 8 Claims



1. An escalator including a plurality of steps having lateral edges which move in spaced relation past stationary skirt panels to define step-skirt gaps, with each step including a tread part having a plurality of spaced, upstanding cleats which start a predetermined dimension from each lateral edge of the step, and with the spaced cleats defining grooves oriented in the direction of step motion, the improvement comprising:
a one-piece, resilient demarcation strip fixed to each step within the predetermined dimension adjacent to each lateral edge,
said demarcation strip including at least first and second cleats which extend integrally upward in spaced relation from a common base to define a groove and add additional

cleats to the tread part, with the first cleat to the demarcation strip being an outermost cleat which is normally spaced from the adjacent skirt panel,

said demarcation strip having a substantially upstanding first surface which faces the adjacent skirt panel and forms one side of said first cleat, and a second surface which extends inwardly from said upstanding first surface for a predetermined dimension, with said second surface extending below the first cleat for the entire length of the first cleat,

and stop means, carried by each step, said second surface being spaced from said stop means when said first cleat is unbiased by external forces,

said demarcation strip being formed of a material which permits said first cleat to move as a whole, both towards and away from the adjacent skirt panel, under the influence of predetermined minimum external forces which bend a portion of the demarcation strip located between said second surface and the groove disposed between said first and second cleats,

said stop means limiting the movement of the first cleat towards the adjacent skirt panel by contact between said second surface and said stop means which occurs substantially simultaneously with contact between the first cleat and the adjacent skirt panel, to limit the magnitude of the forces transferrable from the first cleat into the adjacent skirt panel.

4,570,782

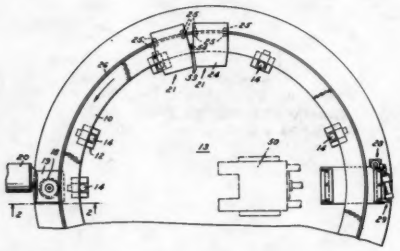
NON-SYNCHRONOUS ROTARY MANUFACTURING SYSTEM

Don A. Cargill, Bloomfield Hills, and Lee K. Fisher, Birmingham, both of Mich., assignors to Cargill Detroit Corporation, Clawson, Mich.

Filed Oct. 20, 1980, Ser. No. 198,525

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—345 **8 Claims**



1. A general rotary path non-sychronous manufacturing system for performing successive accurately interrelated manufacturing operations at successive work stations on production quantities of like workpiece comprising, a plurality of work stations located along a circular path with any desired regular or irregular circumferential spacing, a plurality of fixturized vertically displaceable away from the conveyor surface horizontally unconnected individual workpiece holding pallets each having identical registration means for use in accurately locating and rigidly clamping said pallets at individual work stations, said individual work stations having cooperating accurately locating registration and rigid clamping means for individually orienting and holding each pallet in precise relation to the work operation to be performed on a workpiece held on said pallet, whereby precise relation between successive operations at successive work stations may be accomplished regardless of circumferential spacing and variations in relative radial spacing of respective stations to each other and said circular path, continuously rotating conveyor means for solely supporting and transporting said pallets along said circular path with pallet driving force supplied solely through gravity actuated frictional supporting engagement, retractable means at each work station for stopping a pallet and removing it from said supporting and frictional engagement preparatory to said accurate locating and rigid clamping, and for permitting reengagement of conveyor support and frictional transport upon completion of the work operation, and adjacent pallet interengaging means for queuing successive pallets approaching an occupied work station.

4,570,783

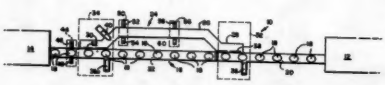
METHOD FOR AUTOMATIC OPERATION OF AN ACCUMULATOR

William F. Newcom, 749 Cheshan Turn, Southampton, Pa. 18966, and Bartel L. Spinelli, 8 Bedford Pl., Fairlawn, N.J. 07410

Filed Aug. 17, 1983, Ser. No. 523,615

Int. Cl.[4] B65G *1/02*

U.S. Cl. 198—347 **7 Claims**



1. A method for the automatic transfer of articles between a main conveyor, which normally transports articles seriatim at a first predetermined speed from a first operational station to a second operational station, and an accumulator conveyor means, having an entry end proximate the main conveyor and an exit end proximate the main conveyor at a location downstream from the entry end, the method comprising the steps of:

a. diverting articles seriatim from the main conveyor into the entry end of the accumulator conveyor means at the first predetermined speed when a downstream article back-up occurs along the main conveyor;

b. storing up to a predetermined quantity of the diverted articles seriatim in the accumulator conveyor means during the downstream article back-up;

c. when the downstream back-up has dissipated, returning the stored articles from the exit end of the accumulator conveyor means on a first-in, first-out basis to the main conveyor at a second, more rapid, predetermined speed while at the same time, diverting additional articles from the main conveyor into the entry end of the accumulator conveyor means at the second predetermined speed; and

d. resuming the normal transport of articles along the main conveyor at the first predetermined speed with no articles passing to or from the accumulator conveyor means once the previously stored articles have passed from the accumulator conveyor means to the main conveyor.

4,570,784

DEVICE FOR RAISING FISH INTO UNIFORM, UPRIGHT BELLY-BACK POSITION

Werner Wenzel, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,568

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311583

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—399 **20 Claims**

1. A device for raising fish of a different size at least having two sides, a belly, a back, a head end and a tail end, and extending from said head end to said tail end along a longitudinal axis, into a uniform upright belly-back position, said device comprising

(a) machine frame means,

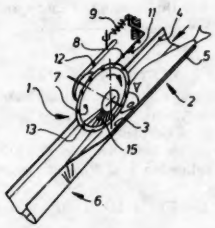
(b) guiding chute means arranged on said machine frame means for guiding said fish lying on one of said sides and essentially in the direction of said longitudinal axis and

(c) an uprighting station arranged on said machine frame means for defining a longitudinal center and including controlling edge means arranged substantially above said longitudinal center,

(d) said controlling edge means, together with said guiding chute means, forming therebetween a passage variable by displacement of one of said means relative to the other,

wherein

(e) said controlling edge means are formed by a periphery defined by circular disc means rotatingly driven about a disc axis and



(f) said guiding chute means at least in the region of said uprighting station having a substantially symmetrical U-shaped cross section formed by a bottom wall and diverging side walls upstanding therefrom, with said bottom wall defining substantially planar bottom surface means of said guiding chute means,

whereby said fish, upon entering said passage are contacted by said controlling edge means and urged by said contact transversely along said flat planar bottom surface means and upwardly along one of said opposing side walls in a direction toward the thicker of said back and belly thereof.

4,570,785

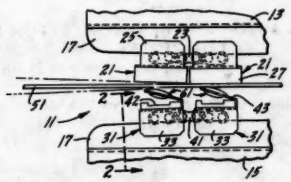
YIELDABLE GRIPPER UNIT

Richard M. Lewanski, Chicago, and Norman R. Buggele, La-Grange, both of Ill., assignors to Sommer & Maca Industries, Inc., Chicago, Ill.

Filed Sep. 4, 1984, Ser. No. 646,945

Int. Cl.[4] B65G *15/14*

U.S. Cl. 198—628 **5 Claims**



1. A yieldable gripper unit for a conveyor of the type in which gripper units forming endless tracks of two conveyor mechanisms which converge to engage and support a sheet of material clamped between them, in which the gripper units of the endless tracks move on rails mounted on tubular supports, and in which one of the endless conveyor tracks is equipped with non-yielding gripper units and the other is equipped with yieldable gripper units, the yieldable gripper unit including:

a generally rectangular base plate having one side facing the sheet of material which is to be clamped and the other side facing its tubular supports,

a yieldable arm cantileverly attached to the base plate and inclined at an acute angle thereto on the sheet material side thereof to permit the arm to yield towards the base plate when the sheet of material is clamped,

a plurality of rubber buttons mounted on the yieldable arm and positioned to contact the sheet of material to be clamped by the gripper unit, and

track engaging means attached to the tubular support side of the base plate.

4,570,786

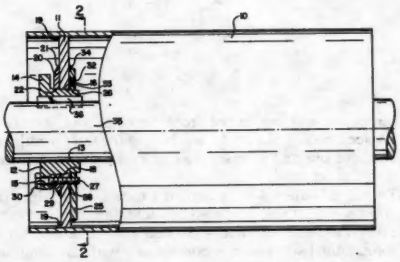
CONVEYOR PULLEY

Thomas E. Morrison, Guin, Ala., assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 437,379, Oct. 28, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 562,631

Int. Cl.[4] B65G *39/10*

U.S. Cl. 198—842 **6 Claims**



1. A conveyor pulley comprising a cylindrical rim, a pair of spaced bushings within said rim, each of said bushings having a central bore, a shaft received by each of said central bores and keyed to said bushings for rotation therewith, said bushings having spaced outer surfaces that taper toward each other, a first annular disc with a central tapered bore received by each of said tapered outer surfaces of said bushings, a second annular disc with a central tapered bore received by each of said tapered outer surface of said bushings, each of said first annular discs being welded to adjacent ones of said second discs along the outer peripheral edge of each of said first discs, each of said second discs welded to said rim along the juncture of the outer peripheral edge of each of said second discs adjacent said rim, a plate member with a central tapered bore received by each of said tapered outer surfaces of said bushings and having its outer edge welded to adjacent ones of said second discs, and means interconnecting each of said bushings with said plates and said discs mounted thereon.

4,570,787

DISPLAY DEVICE

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed May 7, 1985, Ser. No. 731,395

Int. Cl.[4] B65D *5/50*

U.S. Cl. 206—45.14 **4 Claims**

1. A blank for forming a display card with an integral base member having a three dimensional article receiving aperture comprising:

(a) a rear display card panel;

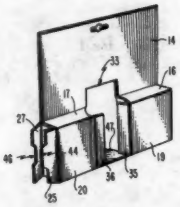
(b) a glue flap foldably attached to one end of the rear display card along a first fold line;

(c) a front display card panel foldably attached to the other end of the rear display card panel along a second fold line.

(d) a pair of laterally spaced top wall panels foldably attached to the other end of the front panel of said display card about a third fold line;

(e) a pair of laterally spaced front wall panels foldably attached to the free edges of said top wall panels about a fourth fold line;

(f) a bottom wall for said base member foldably attached to the free edges of said front wall panels about a fifth fold line;
(g) a first pair of end closure flaps foldably attached to the side edges of the rear panel of said display card;
(h) a second pair of end closure flaps foldably attached to the outer side edges of the front wall panels;
(i) a first cut out in the rear panel of said display card extending from said first fold line having a longitudinal dimension substantially equal to the height of the displayed article and a width less than the width of said displayed article;



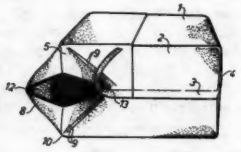
(j) a second cut out in the front panel of said display card adjacent to said third fold line having the same width as said first cut out and a lesser longitudinal dimension than said first cut out; and,
(k) a pair of flaps foldably attached to the inner edges of the front panels of said base member, said flaps being of substantially the same size and separated from one another by a longitudinal slit which is coextensive with the longitudinal center of the first cut out.

4,570,788

PACKING CONTAINER WITH FOLD-OUT POURING SPOUT

Ulf J. M. Lindsjö, Lund, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Feb. 1, 1984, Ser. No. 575,766
Claims priority, application Sweden, Feb. 4, 1983, 8300591
Int. Cl.[4] B65D *5/74*
U.S. Cl. 229—17 R **19 Claims**



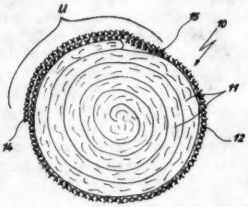
1. A packing container of substantially parallelpipedic shape including an upper wall, a sealing fin extending over said upper wall and dividing said upper wall into first and second upper wall portions positioned on opposite sides of said sealing fin from one another, and an opening arrangement, said opening arrangement comprising: a fold-out pouring spout having first and second spout panels on opposite sides of said sealing fin from one another, said first and second spout panels bordering said first and second upper wall portions, respectively, first linear weakening means for forming at least one first fold-line between said first spout panel and said first upper wall portion when said spout is folded-out and second linear weakening means for forming at least one second fold-line between said second spout panel and said second upper wall portion when said spout is folded-out, said first and second linear weakening means positioned on opposite sides of said sealing fin from one another, said first spout panel being delimited from said first upper wall portion by said first linear weakening means which extends from a corner of said packing container adjacent said first spout panel and said first upper wall portion toward said sealing fin, said first linear weakening means being at a first angle with respect to said sealing fin, said second spout panel being delimited from said second wall portion by said second linear weakening means which extends from a corner of said packing container adjacent said first spout panel and said second upper wall portion toward said sealing fin, said second linear weakening means being at a second angle with respect to said sealing fin, said first and second angles being unequal to each other, whereby the unequal angular relationship of said first and second linear weakening means promotes successive initiation of folding of said first and second linear weakening means so as to facilitate the opening of said spout.

4,570,789

BALE OF STRAW OR HAY

Ulrich Fritz, Erbach, and Rony Kelz, Michelstadt, both of Fed. Rep. of Germany, assignors to Polygress Plastic GmbH, Michelstadt, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 603,213
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 8311900[U]
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—83.5 **5 Claims**



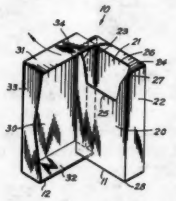
1. A cylindrical bale rolled up of at least one pressed layer of straw, hay or grass and having an outer periphery, the bale being formed at least on said periphery of a netlike band, said netlike band being constituted of a plurality of stretched-out plastic strips made of raschel fabric and having an end portion which overlaps at least one third of said periphery and is self-held thereon due to penetration of the material of the bale through a mesh of the band.

4,570,790

FOLDING CARTON AND BLANK THEREFOR, FOR CIGARETTES

William E. Turnage, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,366
Int. Cl.[4] B65D *5/72*
U.S. Cl. 206—263 **10 Claims**



1. A folding carton comprising:
a caddy member, said caddy member having a solid rectan-

gular shape, and having a height approximately the length of a cigarette, a width approximately an integral multiple of the diameter of a cigarette, and a depth sufficient to accommodate a plurality of rows of cigarettes, said caddy member further having a front wall and a back wall each defined by said height and said width, a top wall and a bottom wall each defined by said width and said depth, and first and second side walls each defined by said height and said depth, said front wall and said top wall each having a cutout portion along the edge common to both said walls, said cutout portions together forming an opening through which cigarettes may be withdrawn; and

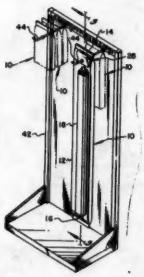
a cover member attached to said first side wall of said caddy member by a hinge, said cover member nestingly engaging said front, top, bottom, and side walls of said caddy member.

4,570,791

REINFORCED HANGING DISPLAY PACKAGE FOR WINDOW SHADE

David R. Hogoboom, Dover, N.J., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 15, 1985, Ser. No. 755,234
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—326 **10 Claims**



1. In combination: an elongated rolled window shade and the like, an elongated flexible envelope for receiving said shade in supportive and protective relationship thereto during display of said shade for the merchandising thereof, and a handle member for said shade disposed within said envelope and oriented for supporting said envelope on a display rack rod to distribute the weight of said shade over a portion of said envelope when supported on said rod.

4,570,792

CASE FOR CURLING IRON OR SIMILAR ARTICLE

Kay S. Conway, 8025 E. Lincoln #273, Scottsdale, Ariz. 85253

Filed Sep. 20, 1984, Ser. No. 652,279
Int. Cl.[4] A45C *11/00*; B65D *81/38*
U.S. Cl. 206—349 **6 Claims**

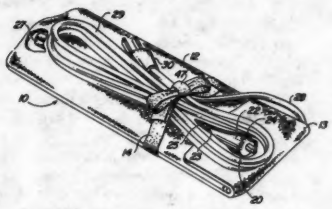
1. A case for stowage of a curling iron or similar article, which device includes

a handle having an attachment end and a free end,

an elongate heatable member extending from the attachment end of said handle and having a free end, and

an elongate flexible power cord extending from said handle, and for protecting the environment from residual heat within said heatable member said case comprising:

a. an insulative sheath for receiving and encasing the heatable member of said device; and



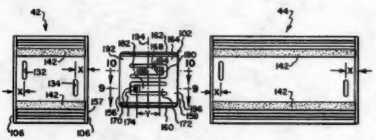
b. securement means for retaining said heatable element within said sheath.

4,570,793

DESK CONSOLE ELEMENT

Robert A. O'Neil, West Chicago; William G. Broman, Chicago; Leon C. Clouser, Lombard, all of Ill.; Adrian T. Dombrowski, Remington, Ind.; Arthur R. Harth, Chicago, and Bernhard O. Williams, Elmhurst, both of Ill., assignors to McDonald Products Corporation, Buffalo, N.Y.

Filed May 21, 1984, Ser. No. 612,432
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—371 **25 Claims**



1. A desk console element for holding a desktop item and suitable for use in an assembly of like elements, said element comprising:

means defining a receptacle for accepting a desktop item and including a member having two opposite ends and defining a substantially planar camming surface extending between said opposite member ends, said camming surface including a detent, said member including two parallel tracks extending between said member ends and associated with said camming surface so that said tracks extend along said camming surface and said detent is positioned generally between said two tracks; together with

a substantially planar clip for releasably connecting said receptacle means to receptacle means of a like element and having two ends, two marginal portions defining two opposite side edges extending between said clip ends and two finger portions positioned generally between said marginal portions, one end of said clip being slidably receivable by said member as said side edges are guided between said tracks, one of said finger portions including a cam-follower surface for sliding relative to and across said camming surface and into and out of interlocking relationship with said detent when said one clip end is slidably received by said member, said tracks maintaining said side edges generally within the plane of said clip as said clip is moved along said tracks, said cam-follower surface adapted to move relative to the plane of said clip when moved into and out of interlocking relationship with said detent and the other finger portion including means extending outwardly from one end of said member when said clip is operatively interlocked with said receptacle means for releasably interlocking said clip and the like element.

24. A desk console element for holding a desktop item and

suitable for use in an assembly of the like elements, said element comprising:

means defining a receptacle for accepting a desktop item, said receptacle means including a member defining a U-shaped channel, two end caps, and two flexible tubes, said channel having two ends, said member including a base for defining the bottom of said channel and two side portions for defining opposite sides of said channel, each of said flexible tubes defining a through-opening between its ends and being snugly fitted within a corresponding side portion, each of said end caps including two shank portions, said two shank portions of each end cap being snugly fitted within the through-openings of said tubes to supportedly attach said two end caps to said side portions of said member and to effectively close said ends of said U-shaped channel so that the receptacle of said receptacle means is collectively defined by said channel and said end caps; together with

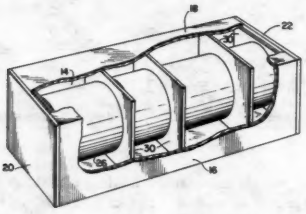
means for releasably connecting said receptacle means to receptacle means of a like element.

4,570,794

SUSPENSION PACKAGING FOR FILM ROLLS

Manuel Capitao, Jr., Bradford, Mass., assignor to Borden, Inc., Columbus, Ohio

Filed Jul. 31, 1984, Ser. No. 636,252
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—394 **3 Claims**



1. A package for a plurality of rolls of polymeric wrapping film, said package being designed so that no part of the package is in contact with the polymeric wrapping film, each said film roll comprising a core and a plurality of convolutions of said film wound on its said core, each said core being generally cylindrical and having a bore, and each said core being of greater axial length than the axial length of the wound film so that there is an end of the core projecting from each side of the wound roll of film,

said package comprising a box having sides and ends and that is long enough to accommodate at least two of said rolls of film in a side-by-side arrangement with their cores aligned on a generally common axis.

at least two of said film rolls being disposed in said box with their cores aligned on a generally common axis,

first partition means disposed in said box intermediate said adjacent pair of film rolls and interposed between the cores of said rolls and disposed in parallelism with said box ends, and other, second partition means disposed in said box adjacent and engaging against the ends of said box respectively, each said partition means being formed with a central opening that is in registry with the bores of said cores of said film rolls, each said partition means engaging against and being supported from the inner surfaces of the sides of said box,

mandrel means inserted in the bores of said cores and through the central openings in said first partition means, said mandrel means having a lesser axial length than the axial length of the aligned cores of said rolls and said first partition means, but projecting through the central opening of said first partition means and being supported thereon,

a pair of caps each having a central boss and a peripheral flange, the bosses of said caps being inserted respectively through said central openings of said second partition means at the opposite ends of said box respectively, and extending into the ends of the cores of said film rolls adjacent the respective opposite box ends in a snug fit,

said mandrel means thereby being confined within the aligned bores of said cores spaced axially from said bosses and said second partition means, and

said mandrel means engaging against and resting on said first partition means and thereby, with said end caps, supporting said rolls in the box on said partition means,

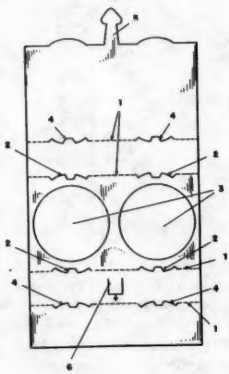
said rolls being positioned so that the wound film is spaced from and is not in contact with the walls or ends of the box, and is spaced from and not in contact with the wound film on any adjacent roll, the inner, confronting film edges of the wound film on adjacent film rolls being spaced apart from each other and also from the partition that is disposed intermediate the rolls, by reason of the ends of the cores projecting from the film rolls.

4,570,795

SUPPORT FOR JARS

Ignacio Fernandez Sanz, Autopista de Malaga, Km 3, Granada, Spain

Filed Dec. 28, 1983, Ser. No. 566,205
Claims priority, application Spain, Apr. 21, 1983, 271.616
Int. Cl.[4] B65D *65/12, 71/00*
U.S. Cl. 206—430 **7 Claims**



1. A support for jars, comprising a single foldable sheet, the foldable sheet comprising:

a central section; a first pair of spaced apart fold lines at opposite sides of the central section; the central section having at least one opening formed therein, the opening being located between and spaced from each of the first pair of fold lines;

a respective first slot being formed in each of the first fold lines and positioned for receiving an edge of a jar projecting through the opening when the sheet is folded along the respective first fold line;

two side sections, each joining the central section at a respective one of the first fold lines; a second pair of fold lines, each respective second fold line being at a side of the respective side section opposite the respective first fold line;

a respective second slot being formed in each of the second fold lines and positioned for receiving an edge of a jar seated atop the jar projecting through the opening when the sheet is folded along the respective second fold line;

two opposite end sections, each joining a respective one of the side sections at the respective second fold line, the opposite end sections being brought together when the sheet is folded along both the first and second fold lines; and

securing means for holding the sheet folded with the end sections together.

4,570,796

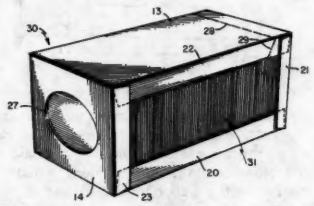
PACKAGE FOR FLOPPY DISK ENVELOPES

James S. Groom, Wales, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Sep. 7, 1984, Ser. No. 648,057

Int. Cl.[4] B65D *83/00, 65/28, 65/32, 85/62*

U.S. Cl. 206—449 **5 Claims**



1. A combination package/dispenser for a plurality of flat, stacked articles prepared from a single elongated blank of paperboard or the like comprising a plurality of panels including front panel, a top panel foldably attached to one edge of said front panel and a glue flap foldably attached to the opposite edge of said front panel, a rear panel foldably attached to the end of said top panel opposite said front panel and a bottom panel foldably attached to the end of said rear panel opposite said top panel, a plurality of flap extensions of abbreviated length attached to and extending for the entire length of the opposed edges of said front and rear end panels, the top panel and the bottom panel, means for adhering the corners of said flap extensions to one another and for adhering the glue flap to the end of the bottom panel for enclosing the stacked articles, an opening means incorporated into the top panel and its adjacent flap extensions for providing access to and dispensing of said stacked articles, said opening means comprising a score line located in said top panel near the rear panel which extends across said top panel in a direction generally parallel to the fold line between said top panel and rear panel, a pair of perforated lines located in the flap extensions attached to the edges of said top panel, said perforated lines extending generally diagonally within said extension flaps from the ends of said score line away from said rear panel and terminating at the edges of said flap extensions, and a further means for releasing the front panel from the package in the vicinity of said glue flap whereby said package may be opened and access gained to the flat, stacked articles by breaking the perforated lines and folding the top panel rearwardly about said fold line.

4,570,797

ADHESIVE TAPE CARRIER FOR PURSE OR POCKET AND METHOD FOR MAKING SAME

Milton Weinman, 5532 S. Shore Dr., Chicago, Ill. 60637

Filed Dec. 10, 1984, Ser. No. 680,076

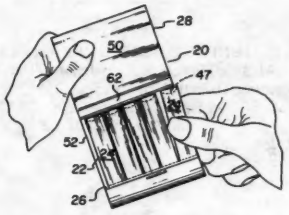
Int. Cl.[4] B65D *83/08*

U.S. Cl. 206—447 **1 Claim**

1. A match-book type carrier for dispensing adhesive tapes of varying lengths from juxtaposed arrays of readily accessible adhesive tapes comprising:

a. a first array of supported adhesive tape strips secured to a first common base, said first array comprising a plurality of one-piece adhesive tape support strips of equal length arranged in side-by-side relation to one another, said adhesive tape support strips having a detachably secured end which is detachably secured to said first common base and a U-shaped free end; and, adhesive-backed tape strips releasably carried on one surface of each of the support strips, each of the tape strips having a coating of adhesive on the entire back surface thereof to enable the entire tape strip to be used by a user; and, each of said tape strips terminating within the U-shaped portion of the support strip to form an exposed adherent finger gripping portion contiguous with the plane formed by the backing surface of the support strip;

b. a second array of supported adhesive tape strips, said supported adhesive tape strips being of different length than the supported adhesive tape strips of the first array secured to a second common base, said second array comprising a plurality of one-piece adhesive tape support strips of equal length arranged in side-by-side relation to one another, said adhesive tape support strips having a detachably secured end which is detachably secured to



said second common base and a U-shaped free end; and, adhesive-backed tape strips releasably carried on one surface of each of the support strips, each of the tape strips having a coating of adhesive on the entire back surface thereof to enable the entire tape strip to be used by a user; and, each of said tape strips terminating within the U-shaped portion of the support strip to form an exposed adherent finger gripping portion contiguous with the plane formed by the backing surface of the support strip;

c. a cover including a front portion, a back portion, a center portion merging into said front and back portions and along which said cover may be folded, a lip portion, and a lower portion merging into said lip and back portions, said cover being folded along said lower portion to form a U-shaped receptable defined by said back portion, lower portion, and lip portion within which the first and second bases are juxtaposed; and,

d. fastening means for securing said first and second juxtaposed bases to said cover.

4,570,798

STACKABLE CONTAINER FOR USE IN BAKERY GOODS DISTRIBUTION SYSTEMS, AND THE LIKE

James D. Wilson, 421 Vista Suerte, Newport Beach, Calif. 92660

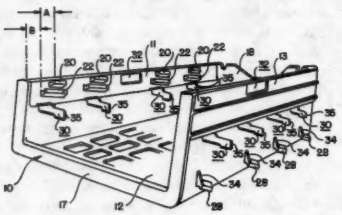
Filed Dec. 26, 1984, Ser. No. 686,440

Int. Cl.[4] B65D *21/04*

U.S. Cl. 206—505 **9 Claims**

1. A stackable container formed of molded plastic material constucted to be stacked on other like containers at different stacking positions, said container having first and second side walls, an open front and a rear wall, each of said side walls having a plurality of discrete integral upper stacking lugs formed on the inner surface thereof at spaced positions along the upper edge thereof from the front to the rear of the container, with each of said upper stacking lugs being formed to slope towards the rear wall of the container, and each of said side walls having a plurality of discrete integral lower stacking feed formed on the outer surface thereof at spaced positions along the lower edge thereof, the lower stacking fee being

positioned to be received on the upper stacking lugs of a like container, and the lower stacking feet likewise being formed to slope towards the rear wall of the container, so that the first-named container moves under the force of gravity towards the rear wall of the like container when the first-named container is stacked on the upper stacking lugs of the like container.

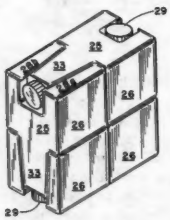


4,570,799

MULTIPLE CONTAINER PACKAGE

Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.

Filed Feb. 6, 1984, Ser. No. 577,177
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—509 **21 Claims**



1. A multiple container package comprising: a plurality of mated containers which together form and substantially fill the volume of a polyhedron having opposite sides in parallel planes; each container having a hollow body which includes a front wall, a planar polygonal rear wall, a planar polygonal bottom wall, planar polygonal lateral side walls and a top shoulder wall, each container having an elongated recess in said bottom wall, said recess extending from the rear wall to the front wall with a length substantially equal to a width of said body between the rear and front walls; each container having an elongated neck extending from the shoulder wall near the rear wall, at least a portion of the neck being coplanar with said planar rear wall, said elongated neck having a length which is substantially equal to the length of the recess; said plurality of containers being mated with the neck of one container extending in the recess of one other container and the shoulder wall of the one container being contiguous with front wall of the one other container, one lateral side wall of each container lying in one of the parallel planes and the other lateral side wall of each container lying in an opposite one of the parallel planes.

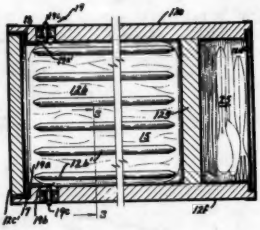
4,570,800

INSULATED FOOD CARRIER

Robert H. Luckett, 7313 S. Moore Ct., Littleton, Colo. 80127

Filed Sep. 6, 1983, Ser. No. 529,278
Int. Cl.[4] A45C *11/20*; F25D *3/08*; B65D *81/38*
U.S. Cl. 206—545 **2 Claims**

1. In combination with a tray containing a heated food product, a portable carrier comprising a thermally insulated top wall, bottom wall, side walls and end walls defining a compartment for receiving said tray containing heated food product, where one of said end walls is selectively removable in a compartment entry relationship, being spring urged to and from a closed portion by release arrangements extending through said side walls, where said tray is slidably and removably disposed within and from said compartment, where an opposite end wall is stationary and serves as a common wall for an adjacent auxiliary normally closed storage compartment defined by portions of said top wall, said bottom wall and said side walls, where said auxiliary storage compartment includes a hinged entry in the form of a wall opposite to said common wall, where said one of said end walls and said hinged entry approximate the same surface area, and where carrying means is disposed on said top wall.

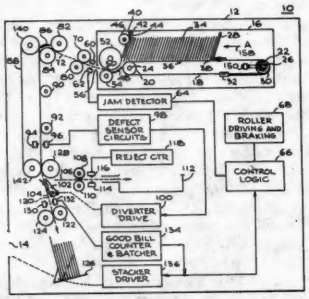


4,570,801

DOCUMENT HANDLING MACHINE

Ralph L. Brannen, 1038½ S. Orange Dr., Los Angeles, Calif. 90019

Filed Mar. 21, 1984, Ser. No. 591,818
Int. Cl.[4] B07C *5/00*
U.S. Cl. 209—534 **6 Claims**



1. A document and currency handling machine which includes:

a document input mechanism including a first endless belt linking first and second rollers, each roller having an axle;

a pusher plate supported on said first endless belt for movement therewith;

a fixed plate supported in said input mechanism in opposition to said pusher plate, said fixed plate having a picker opening therethrough;

a coil spring coupled between said endless belt and said axle of said second roller for biasing said pusher plate towards said fixed plate;

said pusher plate and said fixed plate being adapted for the insertion therebetween of documents to be handled;

a picker roller positioned to protrude through said picker opening to contact any document pushed thereagainst by

said pusher plate and to move any such document out of the space between said pusher plate and said fixed plate;

a document transporting mechanism including a second endless belt;

third and fourth rollers linked by second endless belt;

moving means for moving said documents along said second endless belt;

a defect sensor positioned along said second endless belt in the path of said documents to be handled, said defect sensor producing a defect output signal when a defective bill passes said defect sensor;

fifth and sixth output rollers in pressured contact with each other and positioned along the path of said documents to be handled after said second endless belt;

a diverter positioned along the path of said documents to be handled, after said endless belt and before said fifth and sixth rollers;

a stacker, rotatable from a position in line with the path of said documents to be handled to an output position;

a rejected document container positioned out of the paths, from said second endless belt to said stacker but in a position to cooperate with said diverter;

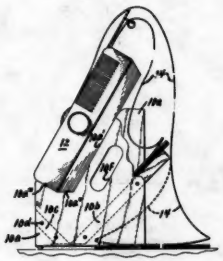
said diverter being responsive to said defect output signal from said defect sensor to divert said documents to be handled from the path to said stacker to the path to said rejected document container.

4,570,802

PRINTER STAND

Michael E. Murphy, R. 6, Phillip Geyer Rd., Boonville, Ind. 47601

Filed Mar. 5, 1984, Ser. No. 586,396
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—13 **2 Claims**



1. A printer stand comprising side walls and a first forwardly inclined wall interconnecting said side walls, each of said side walls characterized by a rearwardly inclined edge portion against which a printer is angularly disposed, said rearwardly inclined edge portion blending into a lower forwardly inclined edge portion serving a printer support relationship, and where a second rearwardly inclined wall interconnecting said side walls abuts with said first forwardly inclined wall behind said printer to present an unprinted paper storage area for said printer.

4,570,803

PORTABLE BALCONY ACCESSORY

Earl H. Peterson, 2300 W. San Angelo, #2164, Gilbert, Ariz. 85234

Filed Jun. 5, 1985, Ser. No. 741,481
Int. Cl.[4] A47F 5/08
U.S. Cl. 211—88 **6 Claims**

1. A balcony accessory adapted for suspension from a balcony rail or the like, said accessory comprising:

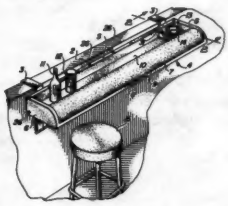
A. an elongated, rectangular bottom piece having first and second opposed long edges, first and second opposed short edges, and upper and lower faces;

B. a pair of suspension brackets, each of said brackets being affixed to said lower face of said bottom piece and being positioned near a short edge thereof, each of said brackets comprising:

i. a downwardly opening U-channel for engaging a balcony rail, said U-channel including parallel first and second legs and a horizontal top connecting said legs; and

ii. a supporting section extending beneath said bottom piece to horizontally support said bottom piece when said bracket is coupled to a balcony rail or the like over which said U-channel section has been emplaced;

C. an elongated inner wall fixed to and extending perpendicularly, with respect to to said upper face of said bottom piece, from said first long edge of said bottom piece;



D. an elongated rectangular resilient pad having first and second opposed long edges and first and second opposed short edges, said pad being fixed to and extending along said upper face of said bottom piece, said first long edge of said pad terminating proximate said second long edge of said bottom piece, said second long edge of said pad terminating intermediate the width of said bottom piece; and

F. first and second end walls, each of said end walls respectively being fixed to and and extending perpendicularly, with respect to said upper face of said upper face of said bottom piece, from a short edge of said bottom piece and reaching to said inner wall;

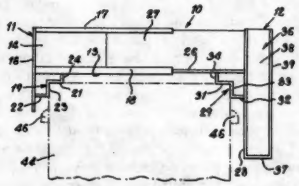
whereby said inner wall, said end walls, said second long edge of said pad, and a thus-bounded portion of said upper face of said bottom piece define a tray-like storage area.

4,570,804

ADJUSTABLE TRAY FOR VIDEO DISPLAY TERMINALS

Vincent D. Meenan, 25 Millbrook Dr., Middletown, N.J. 07748

Filed Jun. 14, 1984, Ser. No. 620,576
Int. Cl.[4] A47F 3/14
U.S. Cl. 211—126 **6 Claims**



1. An expandable tray for mounting on the top of a video display terminal having either a top vent or a side vent for exhausting air from its motor comprising, in combination, two pieces, each of said pieces including a shelf, a back, and a side, interconnecting means on said pieces for slidably closing or expanding said pieces, said interconnecting means including a

guideway on an upper edge of said back of one of said pieces, a guideway on a front edge of said shelf of one of said pieces, an upper edge of said back on the other of said pieces slidable in said upper guideway, a front edge of said shelf on the other of said pieces slidable in said front guideway, whereby said two backs and said two shelves are slidable with respect to each other, and a stepped protuberance on each of said pieces for positioning said tray upon said video display terminal, each of said stepped protuberances including a pair of steps, a first step and a second step, in which each of said steps has a vertical riser and a horizontal tread, wherein said vertical riser of said first step of said one of said pieces is integral with said shelf of said one of said pieces, said horizontal tread of said second step of said one of said pieces is integral with said side of said one of said pieces, said vertical riser of said first step of said other of said pieces is integral with said shelf of said other of said pieces, and said horizontal tread of said second step of said other of said pieces is integral with said side of said other of said pieces.

4,570,805

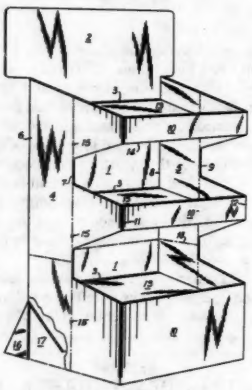
FOLDABLE DISPLAY STAND

Irving Smith, c/o Arrow Art Finishers, 2020 White Plains Rd., Bronx, N.Y. 10462

Continuation-in-part of Ser. No. 310,078, Oct. 9, 1981, Pat. No. 4,493,424. This application Oct. 22, 1984, Ser. No. 663,388

Int. Cl.⁴ A47F 5/11

U.S. Cl. 211—149 **8 Claims**



1. A foldable display stand comprising

a back panel having two lateral edges and including at least one elongated slit extending across said back panel substantially normal to said lateral edges;

at least one pair of said panels each hingedly connected to said back panel at one of said lateral edges and having a substantially centrally situated fold line extending substantially parallel to the respective lateral edge and subdividing the respective side panel into two portions for folding on top of one another next to said back panel in a collapsed condition, and for extending substantially along a common plane substantially normal to that of said back panel in an erect condition, of the display stand;

at least one front panel connected to said side panels to span the distance therebetween at respective end portions thereof remote from said back panel;

at least one shelf hingedly connected to said front panel and extending therefrom into and beyond said slit to be supported in the latter in a substantially horizontal position in said erect condition, and to be juxtaposed with said back panel behind the same in said collapsed condition, of the display stand;

at least one pair of connecting portions each hingedly connected to one of said side panels at the region of said fold line thereof and extending therefrom into the space between said front and back panel underneath said shelf as considered in said erect position and toward each other, each of said connecting portions having an elongated slot extending substantially normal to said shelf in said erect condition and opening onto an edge of the respective connecting portion; and

an endless elastically yieldable element having reversing portions received in said slots and element portions interconnecting said reversing portions and extending along those zones of said connecting portions which are located between the respective slots for urging said connecting portions toward one another and thus said side panel portions toward said common planes of said side panels to erect the display stand with snap action.

4,570,806

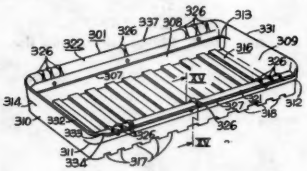
TOTE PAN AND WAREHOUSE RACK STRUCTURE THEREFOR

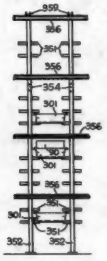
Michael D. Dushenko, Macedon, N.Y.; Harvey R. Castner, New Berlin, Wis.; Robert T. Baugh, Brookfield, Wis., and Paul T. Shupert, Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 31, 1983, Ser. No. 499,463

Int. Cl.⁴ A47F 5/00

U.S. Cl. 211—191 **9 Claims**





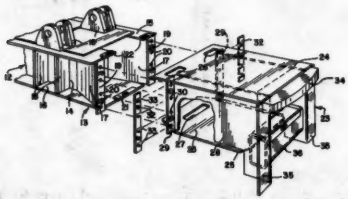
1. A warehouse having an aisle with storage racks at opposite sides thereof, each storage rack including a plurality of vertically disposed uprights spaced at predetermined intervals in a first vertical plane adjacent said aisle and a plurality of vertically disposed uprights spaced at corresponding predetermined intervals in a second vertical plane parallel to said first plane and spaced a predetermined distance therefrom in the direction away from said aisle, cantilever pan support brackets rigidly secured at predetermined vertical intervals to said uprights, said brackets at the same level on adjacent uprights in said planes extending toward one another and parallel to said aisle, said brackets defining storage compartments for and being adapted to support tote pans, and a plurality of tote pans with each tote pan having a bottom presenting downwardly facing recesses registering with a pair of brackets on an adjacent pair of uprights in each of said planes.

4,570,807

RAILWAY CAR UNDERFRAME

Roy W. Miller, Highland, and Robert J. Kunst, Crown Point, both of Ind., assignors to Pullman Standard Inc., Chicago, Ill.

Filed Sep. 15, 1983, Ser. No. 532,544
Int. Cl.[4] B61F 1/02
U.S. Cl. 213—60 13 Claims



1. A railway car underframe comprising a center sill including first upright side walls and upper and lower horizontal walls,

a draft housing provided at an end of said sill including vertical sill wall portions tapering diagonally outwardly to provide a bell mouth configuration adapted to connect a drawbar to said housing for swinging draft movement, the improvement of

a coupler support housing including second upright and lower and upper horizontal walls conforming to said first walls,

connecting means between said draft housing and said support housing releasably securing said support housing to said draft housing to provide an extension thereof,

said support housing including a transversely extending coupler support,

first shear means on said draft housing,

second shear means on said coupler support housing, and

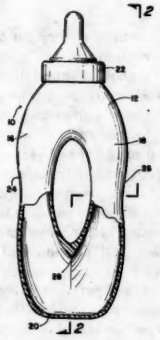
said first shear means intercoupling with said second shear means, said first shear means and said second shear means having means opposing said second shear means in shear loading when the draft housing and the coupler support housing are drawn apart.

4,570,808

BABY BOTTLE WITH INTEGRAL HANDLE

William O. Campbell, and Nickie G. Campbell, both of 2633 N. Country Club Rd., Muskogee, Okla. 74403, assignors to William O. Campbell and Nickie G. Campbell, both of Muskogee, Okla.

Filed Apr. 6, 1984, Ser. No. 597,388
Int. Cl.[4] A61J 9/00, 9/06; B65D 23/10
U.S. Cl. 215—11 R 2 Claims



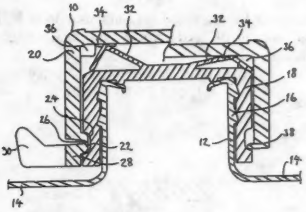
1. A baby bottle, comprising: a unitary fluid container having a bottle portion provided with a closed end, a top portion provided with an open end for removably receiving a nipple, said closed and open ends lying along the longitudinal axis of the container, and an elongated opening formed substantially centrally of both the longitudinal and lateral axes of the container between said bottom and top portions in the area of the center of gravity of the container when filled with fluid, said opening forming two elongated tubular segments connecting said bottom and top portions of the container, each of said elongated tubular segments having a surface thst is concave defining a circumferential dimension in the vicinity of the lateral axis of the opening which is smaller than the circumferential dimensions of the remaining portions thereof enabling the elongated tubular element to be grasped by a baby during feeding for independent support of the container by the baby.

4,570,809

CHILD PROOF CAP HAVING TAMPER MEANS

David Archer, 6, Higham Stn. Ave., Chingford, London E4 9 AZ, England

Filed Oct. 5, 1984, Ser. No. 659,822
Int. Cl.[4] B65D 55/02
U.S. Cl. 215—220 8 Claims



1. A closure cap for a container comprising:

(a) an inner cap having an internal screw-thread which engages an externally screw-threaded otherwise open end of a container when the closure cap is in use;

(b) an outer cap which is mounted on said inner cap so as to cover and surround said inner cap and so as to be moveable in an axial direction in relation thereto;

(c) engagement means of said inner and outer caps arranged to enable the closure cap to be removed from the container by means of said outer cap following a relative axial movement between the inner and outer caps;

(d) a removeable tamper evident strip forming a lower rim of said outer cap; and

(e) an annular groove around the outside of said inner cap which is engaged by said strip thereby to obstruct such relative axial movement until it is removed.

4,570,810

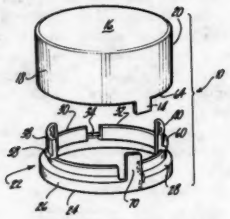
CAP WITH TAMPER INDICATING BAND

Gene Hawkins, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 15, 1985, Ser. No. 712,379
Int. Cl.[4] B65D 41/32
U.S. Cl. 215—253 14 Claims

10. In combination, a tamper indicating band for a container cap having locking tabs and sections normal to said tabs adapted to be squeezed to distort said cap for removal from a container, and a container cap, including: said band having a ring-like base member having an inner periphery shaped to conform to the outer periphery of a portion of a container to be closed, said band having a pair of diametrically opposed radially extending vertical slots, a frangible section in said band extending through said ring-like base member and a tear tab affixed to said band for applying manual force to break said

band at said frangible section, said cap having a depending skirt, a pair of diametrically opposed tabs extending downwardly from said depending cap skirt aligned in position with



said slots in said band, said band having a portion received within said cap skirt substantially adjacent to and facing the inner periphery of said cap skirt and preventing inward diametrical distortion of said inner periphery of said cap skirt.

4,570,811

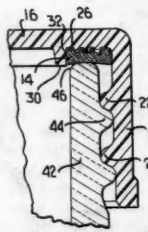
PLASTIC CLOSURE WITH FLOWED-IN PLASTISOL LINING

Frank H. Lecinski, Harwood Heights, and John N. Banich, Sr., Chicago, both of Ill., assignors to Continental White Cap, Inc., Northbrook, Ill.

Filed Jan. 30, 1985, Ser. No. 696,470

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—343 **15 Claims**



1. A closure having a seat for a liner, said seat being generally channel-shaped in cross section and including a base, said seat being improved by a plurality of abutments projecting from said base into said seat for interlocking with a liner when placed in said seat, said abutments each having at its connection with said base a fillet for preventing entrapment of air as a liner is being applied into said seat.

4,570,812

RECESSED FLEXIBLE WALL REFUSE CONTAINER

Joel E. Curtis, Chickasha, Okla., assignor to Southwestern Products, Inc., Norman, Okla.

Filed Dec. 20, 1984, Ser. No. 684,436

Int. Cl.[4] B65D *25/18, 25/38, 47/08, 90/04*

U.S. Cl. 220—1 T **3 Claims**

1. A concealed refuse container, comprising:

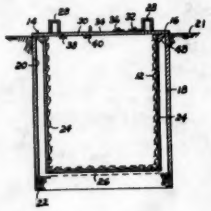
a planar cover adapted to overly and close an upwardly open well formed in the surface of the earth, said cover having a central opening;

lid means for normally closing the central opening;

a pair of tubular members horizontally secured in overlying parallel spaced-apart relation to diametrically opposite edge portions of said cover;

a flexible wall container depending from said cover and substantially filling the well, said container having a wall and having an open end communicating with the lid closed cover opening;

container wall stabilizer means including vertically oriented elongated members substantially coextensive with the



depth of the well depending from said cover for preventing inward collapse of said flexible wall when said cover is inverted; and,

means horizontally interconnecting the ends of said elongated members opposite the cover.

4,570,813

CONNECTION ANCHOR FOR LINER OF CAST IRON PRESSURE TANK

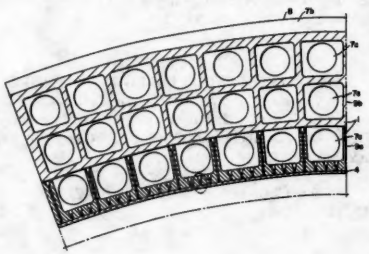
Rolf Weber; Gerd Pollak, and Arno Chlechowitz, all of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Continuation of Ser. No. 526,351, Aug. 25, 1983. This application May 6, 1985, Ser. No. 731,057

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246560

Int. Cl.[4] B65D *45/02*

U.S. Cl. 220—3 **8 Claims**



1. A linner connection anchor for a pressure vessel which includes an axis, a bottom, a cover, a vessel multiple shell body, and a steel liner which is anchored directly to the inside of said vessel multiple shell body by means of a bolt connection in combination therewith comprising at least two cylindrical shells, which are formed of cast elements and which are successively arranged in radial and tangential direction; said cast elements being provided with axially extending prestressing channels therein which are distributed over the periphery of said cylindrical vessel body, and also being provided with said tangential prestressing channels to received therein means for restraining together said bottom, said cover, and said vessel multiple shell body to compensate for dimensional length variations caused by temperature influence thereon and also to compensate for pressure loading of the pressure vessel in order to guarantee necessary stability of the pressure vessel including particularly said multiple shell body thereof.

4,570,814

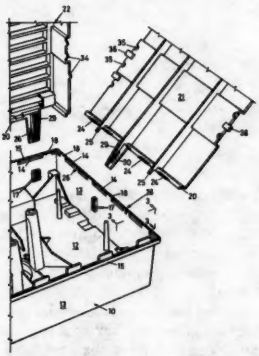
COOLER CASE CONSTRUCTION

Frederic F. Seeley, St. Marys, Australia, assignor to F. F. Seeley Nominees Pty. Ltd., South Australia, Australia

Continuation-in-part of Ser. No. 293,369, Aug. 17, 1981, abandoned. This application May 24, 1983, Ser. No. 497,699

Int. Cl.[4] B65D 6/22

U.S. Cl. 220—4 F 7 Claims



1. A cooler case comprising opposite side panels, a front panel, a rear panel, and a tank body,

said tank body having a base and upstanding side walls which terminate along their upper edges in horizontal support surfaces having an outer upturned flange, a plurality of projections upstanding from the support surfaces and spaced inwardly from said upturned flange and spaced from one another, and retaining lugs projecting inwardly into the tank body from the side walls thereof,

flanges projecting inwardly from said side, front, and rear panels at their respective lower edges to be supported by respective side wall support surfaces, each said flange also having at the inner edge thereof a downturned flange which, upon assembly, abuts said upstanding projections, the lower edges and also having inwardly directed lugs which, upon assembly are located between adjacent said upstanding projections and thereby locate said panels with respect to said tank body, each said panel also having a respective engaging plate depending from the lower edge thereof into the tank body,

each said engaging plate having lug engaging surfaces which frictionally engage respective said tank body retaining lugs upon hinging movement of the respective said panel to an erected position when supported by said support surface,

said case also having a top panel,

each contiguous edge of said side panels, front panel, rear panel and top panel having barb surfaces which interengage upon assembly by resilient deformation of said panels but are also releaseable from one another by said resilient deformation.

4,570,815

FLUID-TIGHT CONNECTING STRUCTURE AND STORAGE TANK IN PARTICULAR FOR A MOLTEN SALT, FITTED WITH SAID STRUCTURE

Pierre Morand, Feucherolles, France, assignor to Technigaz, France

Filed Apr. 23, 1984, Ser. No. 602,958

Claims priority, application France, Apr. 25, 1983, 83 06762

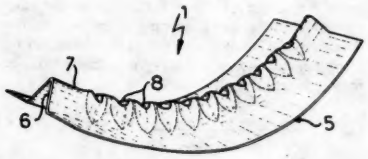
Int. Cl.[4] B65D 7/24

U.S. Cl. 220—75 12 Claims

1. A fluid-tight connection structure between a substantially cylindrical vertical side wall and a hanging roof of a storage tank, particularly for molten salt, said side wall being of the corrugated type with substantially parallel vertical corrugations, wherein said connection structure comprises

a plurality of longitudinally arcuate metal strip-like connecting elements, each being provided with at least one longitudinally extending corrugation, a crest of which is formed with spaced transverse depressions and at each side of said corrugation with a longitudinally extending originally substantially transversely flat side portion from which said corrugation extend perpendicularly towards the interior of the tank,

the corrugations of said connecting elements having a cross-section corresponding to one of the vertical side wall corrugations, said corrugation cross-section having a form of an acute angle, allowing deformation of said corrugation substantially along the line of said crest for presenting a progressively decreasing width from one end to the other, without deformation of the cross-section of said corrugation at the widest end,



said side portions of each connecting element being deformable for transforming said initially flat transverse shape into an arcuate shape corresponding to the arcuate shape of the cylindrical side wall of the tank,

each connecting element being tightly secured, after having been subjected to said deformations, by each of its longitudinally extending side portions to a longitudinally extending side portion of an adjacent element to form an annular portion of a sphere, said sphere portion being fluid-tightly secured at its radially outer circular edge portion in overlapping relationship to the vertical tank side wall so that said corrugations and said corrugation side portions of said annular sphere portion at said outer edge portion match the vertical corrugations and the corrugation side portions of the tank side wall, and at its radially inner edge portion to the roof of the tank.

4,570,816

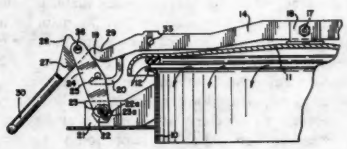
HATCH COVER AND LOCKING STRUCTURE

Ray L. Ferris, Thornton, and Donald B. Yates, Homewood, both of Ill., assignors to Pullman Standard, Inc., Chicago, Ill.

Filed Oct. 10, 1984, Ser. No. 659,559

Int. Cl.[4] B65D 45/24, 45/28; B61D 17/12, 39/00

U.S. Cl. 220—314 18 Claims



1. In a hatch cover assembly for a lading container having an upper deck surface defining a hatch opening and a hatch cover adapted to cover the hatch opening and pivotally associated with the hatch opening so that the hatch cover is pivotable toward and away from the hatch opening, a latch arrangement comprising:

a latch engagement structure operatively associated with the hatch cover comprising

a first latch engagement portion, and

a second latch engagement portion spaced from the first latch engagement portion,

the first and second latch engagement portions defining a space therebetween; and

a latch structure associated with the upper deck surface and adapted to engage with the latch engagement structure for retaining the hatch cover in a locked position, the latch structure comprising

a link means associated with the upper deck surface, and

first and second latch members connected with the link means,

the first latch member being adapted to engage the first latch engagement portion for sealingly engaging the hatch cover over the hatch opening,

the second latch member being adapted to enter into the space between the first and second latch engagement portions when the first latch member is engaged with the first latch engagement portion,

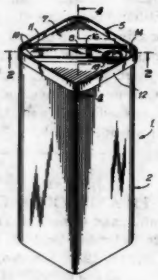
the second latch member being engageable with the second latch engagement portion for retaining the hatch cover spaced from the hatch opening in position relatively further from the hatch opening than that taken during sealing engagement, whereby excess pressure in the container may dissipate.

4,570,817

SLIDEABLE RECLOSABLE PLASTIC LID

Thomas P. Hambleton, and Richard R. Triggiani, both of Pine Bush, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,528
Int. Cl.[4] B65D *43/20*
U.S. Cl. 220—345 **14 Claims**



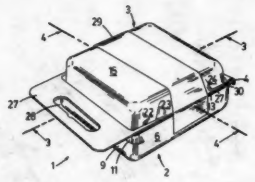
1. A container lid composed of a plastic material comprising a main lid member and a slide member, the main lid member having supporting guideways between which the slide member is situated, the guideways being angled relative to the plane of the main lid member so as to hold the slide member on the lid and at least one aperture for dispensing or collecting the container contents, the aperture being located at a point on the main lid member such that at least a portion of the slide member can be moved along the path between the guideways to a position covering the aperture, the slide member having a formed recess which protrudes from its lower surface, the dimensions of the recess corresponding substantially to the dimensions of the lid aperture for forming a tight-fitting lid closure when the slide member is in the closed position over the lid aperture, and the slide member having a finger engageable portion for moving the slide between a closed position over the aperture and an open position in which the aperture is exposed.

4,570,818

RECLOSABLE CONTAINER WITH LABEL BRIDGE

Rodney D. Borst, Oregon, and Thomas J. Mohs, Madison, both of Wis., assignors to Placon Corporation, Madison, Wis.

Filed Jun. 8, 1984, Ser. No. 618,561
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—339 **21 Claims**



1. A reclosable container of thin flexible thermoformed plastic materials, comprising:

(a) a container base having a bottom portion;

(b) base walls extending from the periphery of the base bottom portion in continuous joined relation upwardly to a rim portion

(c) a container lid defining a substantial portion of the volume of the container and having a top wall portion;

(d) lid walls extending from the periphery of the lid top portion in continuous joined relation;

(e) a peripheral lid rim including first and second rim portions;

(f) said first rim portion of the lid walls terminating in a generally U-shaped outward bend which overlaps an interior portion of said base walls adjacent said rim portion of the base walls when the container is closed, the first rim portion having outer walls which are shaped to closely conform to and be snugly received inside the base walls when the container is closed to strengthen the container;

(g) said second lid rim portion interrupting the first lid rim portion said second lid rim portion being flared outwardly from the lid top wall portion and the lid first rim portion, the second lid rim portion terminating closer to the top wall portion of the lid than the first lid rim portion to substantially abut a portion of the base walls when the container is closed, the abutting portions of the lid walls and base walls cooperating to form a substantially continuous label bridge over which a label may be substantially smoothly applied and substantially continuously underlain and supported by the closed container; and

(h) an integral hinge joining the base to the lid such that the container may be opened or closed in hinged relation.

4,570,819

FILL MEANS FOR CRYOGENIC FLASKS

Warren E. Perkins, Port St. Lucie, and Mark T. Novak, Jensen Beach, both of Fla., assignors to Cryo, Corporation, Fort Pierce, Fla.

Filed Nov. 30, 1983, Ser. No. 556,390
Int. Cl.[4] F17C *6/00*
U.S. Cl. 220—374 **12 Claims**

1. Filling means for a liquid cryogen container comprising:

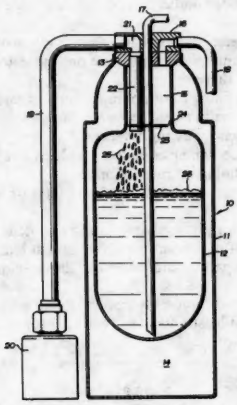
a vacuum insulated flask having a relatively small, elongated cylindrical neck;

cap means closing the top of the flask neck;

a thin flat, circular baffle having a circumferential edge and fixedly disposed across said flask neck adjacent the bottom thereof, the diameter of said baffle being slightly smaller than the interior diameter of said flask neck so as to provide a narrow, annular opening between the baffle edge and the flask neck;

a liquid fill tube communicating through said closure means

and said baffle and terminating at a point just below said baffle, and



vent means communicating through said closure means between the interior of said flask neck and the exterior of said flask.

4,570,820

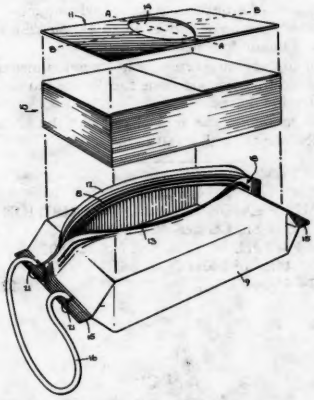
RESEALABLE DISPENSING CONTAINER FOR FOLDED TOWELS

Betty J. Murphy, Upper Montclair, N.J., assignor to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation of Ser. No. 458,782, Jan. 18, 1983, abandoned. This application Jan. 23, 1985, Ser. No. 694,471

Int. Cl.[4] B65H *1/00*

U.S. Cl. 221—34 **10 Claims**



1. A flexible container containing a stack of towels and adapted for dispensing said towels comprising a moisture impermeable flexible envelope having a resealable opening and said envelope having in the interior space thereof a movable aperatured stiffening plate of an area substantially equivalent to one surface of said envelope and one surface of said towel stack, said plate being positioned between said towel stack surface and said envelope surface so that said aperture is aligned with said resealable opening in the envelope surface, and said towels being stacked and sized so as to be sequentially removable through said aperture and said opening, and said opening having two opposed edges equipped with opposed closure member strips which are attached adjacent to said edges and are adapted so as to interlock and seal said opening under pressure; wherein said resealable opening is centered on an axis of said envelope surface and is large enough to permit a removed towel to be reinserted between said surface and the stiffening plate; a pair of crimped end walls at opposing ends of said resealable opening, and at least one of said end walls having means for suspending said container attached thereto; and wherein said edges may be sealed together so as to form a flange which acts to cover and protect said interlocked closure members.

4,570,821

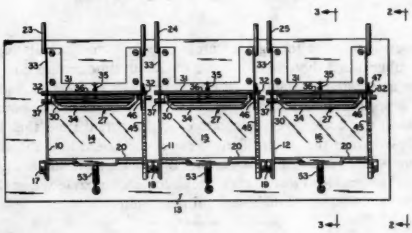
ARTICLE-DISPENSING ASSEMBLY FOR A VENDING MACHINE

Charlie R. Holland, St. Louis, and Michael J. DelPercio, Fenton, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Dec. 20, 1982, Ser. No. 451,454

Int. Cl.[4] B65H *3/00*

U.S. Cl. 221—194 **19 Claims**



1. An article-dispensing assembly, comprising:

(a) a plate provided with an opening,

(b) a door having a lower portion hingedly attached to the plate, the door being movable selectively to a first position to close the opening and to a second position to open the opening, and the door including a shelf extending inwardly of the opening and providing a bin for holding an article to be dispensed,

(c) feed means for feeding articles to the bin,

(d) a control means disposed above the hinge and having an article-engageable means movable to a first position to allow transfer of an article from the feed means to the bin, and movable to a second position to engage an article to block transfer of an article from the feed means to the bin, and

(e) operating means connected to the door and engageable by the control means to allow the article-engageable means to move into the second position substantially when the door is moved from its first closed position and maintain said engagement until the door is substantially returned to its first position, the movement of the article-engageable means being disproportionate relative to the movement of the door.

4,570,822

COMPUTER OPERATED FILLING SYSTEM

Robert A. Procacino, Haddon Heights, N.J., assignor to Cozzoli Machine Co., Plainfield, N.J.

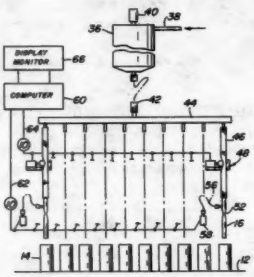
Continuation of Ser. No. 275,094, Jun. 19, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,081

Int. Cl.[4] B67D *5/14*

U.S. Cl. 222—14 **10 Claims**

1. A container filling machine comprising a liquid holding tank connected to a distribution manifold therebelow so that

liquid may flow from said tank to said manifold by gravity, a plurality of discharge nozzles for simultaneously filling a plurality of containers, each nozzle being connected to said manifold by a discrete flexible hose, each nozzle having a restriction, a discrete means for sensing pressure in each nozzle upstream from its restriction for generating a pressure signal, a discrete valve for controlling flow through each flexible hose, and a programmable means separately connected to the pressure sensing means and valve associated with each nozzle for



repetitively monitoring said pressure signal and calculating a number based thereon indicative of the fill time required to fill the associated container with a preselected volume of liquid, said programmable means being operative for counting counts which are collectively indicative of the actual time that has elapsed from the onset of the flow of the liquid into the containers, for comparing the number of counts with said fill time number, and for closing each valve for each nozzle when said number of counts equals said fill time number.

4,570,823

SOAP SOLUTION DISPENSER INCLUDING INDICATOR MEANS FOR INDICATING THE FILLING STATE THEREOF

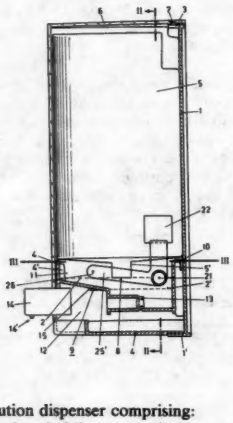
Sandro Arabian, Vaduz, Liechtenstein; Manfred Baumann, and Walter Besserer, both of Diepoldsau, Switzerland, assignors to CWS AG, Baar, Switzerland

Filed Dec. 19, 1983, Ser. No. 563,045

Claims priority, application Switzerland, Dec. 24, 1982, 7 544/82

Int. Cl.⁴ B67D *5/30*

U.S. Cl. 222—26 **6 Claims**



1. A soap solution dispenser comprising:

at least one container holding soap solution; a reservoir;

a cover enclosing said at least one container and said reservoir and including at least one viewing window;

indicating means for indicating the filling state of the soap solution dispenser;

said indicating means comprising a float body provided in said reservoir and equipped with at least one indicator flag operatively coupled thereto;

said float body defining a path of movement of said at least one indicator flag within said cover which at least partially extends along said viewing window;

said at least one container containing at least one outlet;

said reservoir defining an interior space;

said at least one outlet opening into said interior space of said reservoir;

at least one lever for pivotably mounting said float body in said interior space of said reservoir above said at least one outlet;

pivot means arranged in said reservoir above said at least one outlet; and

said at least one lever pivotably engaging said pivot means at a region of said at least one lever remote from said float body and said indicator flag.

4,570,824

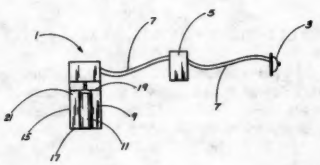
DOORBELL ACTUATED AIR FRESHENER

Yvonne Bolling, 3833 Mercer La., Harvey, La. 70058

Filed Sep. 12, 1983, Ser. No. 531,501

Int. Cl.⁴ B67D *5/32*

U.S. Cl. 222—39 **4 Claims**



1. An apparatus for dispensing a metered amount of aerosol of air freshener from an aerosol can into a room responsive to actuation of a house door bell, comprising:

an electrically operated aerosol can actuation means;

means for electrically connecting the doorbell to the aerosol can actuation means;

means for mounting the aerosol can and the aerosol can actuation means on the wall in the room.

4,570,825

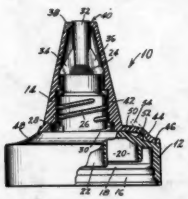
TAMPER-EVIDENT CAP CONSTRUCTION

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed Jul. 10, 1984, Ser. No. 629,505

Int. Cl.⁴ B67D *5/22*; B65D *47/10*

U.S. Cl. 222—45 **12 Claims**



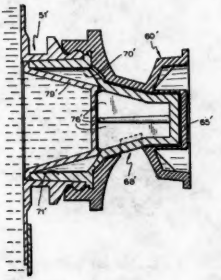
1. A tamper-evident cap construction, comprising in combination:

(a) a cap body having a discharge opening,

(b) a screw cap adapted to be received on said cap body so as to selectively close off the discharge opening thereof,

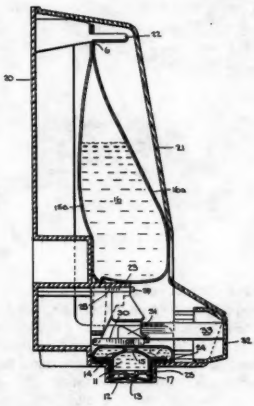
(c) a frangible resilient tab integral with the screw cap and extending outwardly past the periphery thereof in overlying relation to an exposed exterior surface of the cap body,
(d) said tab being integral with the cap body by virtue of a common fused juncture area at the said exposed exterior surface of the body so as to resist relative turning between the screw cap and cap body,
(e) said tab having a transverse line of weakness adapted to rupture when a turning force is applied between said screw cap and cap body,
(f) said cap body having an upstanding projection underlying the tab and biasing central portions thereof upwardly such that upon rupture of the tab, a torn end thereof will be upwardly displaced by the upstanding projection, thereby to indicate to a potential user that the cap has been tampered with.

4,570,826
DISPENSER CLOSURE
Lazzaro A. Fattori, Atlantis, Fla., assignor to The Rel Corporation, Montclair, N.J.
Filed Mar. 31, 1983, Ser. No. 480,703
Int. Cl.[4] B65D *47/36*
U.S. Cl. 222—83 **26 Claims**



1. A dispenser closure of an elastomeric plastic material adapted for mounting on the delivery end of a tubular spout, comprising a housing enclosing a valve member, said housing having a valve seat formed with an opening to the exterior and a forward extension beyond said opening formed as a hollow inwardly compressible push button, said valve member being a one piece structure comprising a rearwardly extending sleeve for mounting said tubular spout, an annular diaphragm having openings therethrough and being formed as a normally forwardly convex extension of said sleeve, a valve body extending forwardly from the center of the diaphragm and contoured to engage said valve seat to close said opening when the diaphragm is in convex configuration and having a closed end wall extension projecting into said hollow push button, said annular diaphragm being resiliently deformable into invaginated configuration by an inward axial force applied to said closed end wall through the push button to unseat said valve body whereby to permit a commodity to flow through said openings in the diaphragm, between said valve body and valve seat and through said valve seat opening to the exterior, said housing having a sleeve of a diameter for fitting the exterior of the tubular spout, said valve member sleeve being concentrically spaced from said housing sleeve and defining a space therebetween in which said tubular spout is adapted to be received.

4,570,827
LIQUID DISPENSER
Stanley L. Roggenburg, Jr., Staten Island, N.Y., and Robert H. Laauwe, Franklin Lakes, N.J., assignors to Essex Chemical Corp., Clifton, N.J.
Filed Mar. 28, 1984, Ser. No. 594,383
Int. Cl.[4] B65D *35/28; B67D 5/06*
U.S. Cl. 222—95 **5 Claims**



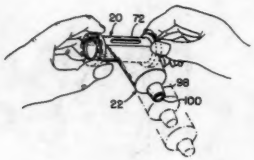
1. A liquid dispenser comprising a flexible bag adapted to be positioned upright and contain the liquid and having front and back walls with bottom portions and a dispensing valve in the bottom portion of the back wall, the valve having an operator inside the bag and actuated by pressing the bottom portion of the front wall against the operator, the bottom portions of the two walls being foldable on a transverse fold line to horizontal positions so as to superimpose the bottom portion of the front wall on the bottom portion of the back wall and the operator; wherein the improvement comprises the front and back walls being formed with mutually registered openings above the fold line, the openings having peripheries which are sealed fluid-tightly together and the openings forming a horizontal passage extending right-angularly through the bag above the fold line, said liquid dispenser having an enclosing box having an openable front closure and suspension means for suspending the bag therein by the top of the bag when the bag contains the liquid, the box having a support for the bag's bottom portions when they are folded to the horizontal positions, the box having a movable pressing means for pressing the lower portion of the front wall against the operator of the valve and at least a portion of the pressing means being movable through the passage.

4,570,828
FINGER MANIPULATED DISPENSER OF VISCOUS LIQUIDS FROM A FLEXIBLE TUBE
Kenneth G. Wood, 4417 Evanston Ave. N., Seattle, Wash. 98103
Filed Apr. 6, 1984, Ser. No. 597,267
Int. Cl.[4] B65D *35/34*
U.S. Cl. 222—100 **2 Claims**

1. A finger manipulated dispenser for periodically rolling up tube portions of a flexible tube containing viscous liquids, using the fingers of two hands, from which some of the viscous liquid contents have been previously squeezed out in normal one hand and finger operation, to simultaneously, both draw in empty tube portions and redistribute the remaining viscous liquid contents into tube portions, yet to be drawn into the dispenser, comprising:
(a) a small diameter hollow core having an enlarged flange on one end to receive one hand finger applied rotating

forces and an opposite end having a diameter equal to the small diameter core, said core having a longitudinal slot commencing in an open entry at the opposite end and terminating in a closed end adjacent the flange for receiving the bottom of a tube, said opposite end having a pawl integrally formed therewith as a partial radial cut of said core, said pawl having a diameter larger than the opposite end and is intergrally formed with one butting surface and an opposite sloping surface; and

(b) a large diameter hollow spool having an enlarged flange at a first end with spaced circumferential ratchet teeth to receive one hand finger applied rotating forces and to



receive the pawl of said core when said core is inserted in said spool, said ratchet teeth allowing the pawl to escape in one rotational direction of the core relative to the spool and to be held by the ratchet teeth in the opposite rotational direction, said spool having a second end opposite the first end and a longitudinal slot commencing in an open entry at the second end and continuing throughout the remaining length of the spool, whereby, the bottom of a tube, after first being endwise inserted through the longitudinal slot of the core, is then, along with the hollow core is endwise inserted through the longitudinal slot of the hollow spool and the hollow spool respectively.

4,570,829

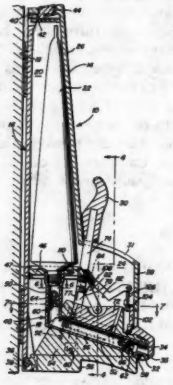
TOOTHPASTE DISPENSER

Kenneth M. Allen, P.O. Box 1602, Quincy, Calif. 95971

Filed Aug. 15, 1983, Ser. No. 523,353

Int. Cl.[4] B67D *5/06*; F16L *55/14*

U.S. Cl. 222—181 **9 Claims**



1. A dispenser for toothpaste and like viscous fluids comprising a dispensing duct of a resilient compressible material having an inlet and outlet, means for supporting a tube of toothpaste in inverted condition with the neck of the tube communicating with the inlet of said duct, means for manually compressing and then releasing portion of the duct, valve means within the duct for allowing toothpaste therein to be squeezed through the outlet when the duct is compressed while preventing toothpaste therein from being squeezed back into the toothpaste tube, and for allowing toothpaste from the tube to be drawn into the inlet by suction when the duct expands upon release of said portion thereof while preventing outside air from being drawn into the outlet, whereby operation of the compressing and releasing means provides a pumping action on the duct causing a metered quantity of toothpaste to be dispensed through the outlet each time the duct is compressed, wherein the compressing and releasing means comprises a plunger means engaging said portion of the duct, and means for manually depressing the plunger means to compress the duct and raising the plunger means to release the duct, the dispenser further including means for applying lateral pressure to the duct upon raising of the plunger means effective to restore the duct to its original cross-sectional form, thereby enhancing the creation of vacuum within the duct drawing in paste from said tube, wherein the lateral pressure applying means comprise pressure doors embracing opposite sides of the duct and spring means urging the doors to apply laterally inward pressure on the duct.

4,570,830

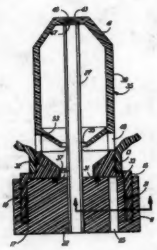
GRAVITY DISPENSER

Edward L. Jeans, Gwent, Wales, assignor to Cadbury Schweppes, PLC, London, United Kingdom

Filed Jun. 28, 1983, Ser. No. 508,559

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—185 **16 Claims**



1. Flow control apparatus for use with a closed container, for controlling the dispensing of a concentrate at a predetermined flow rate comprising:

(a) a first part, terminating in a first valve part and adapted to be placed in communication with a volume of concentrate contained within the container;

(b) a second, cap-like member surrounding said first part and having a second mating valve part therein and having means forming an outlet opening, said cap-like member movable with respect to said first part to selectively move said first and second valve parts with respect to each other by a preselected amount to permit flow of said concentrate from said first part through said valve parts and out through said outlet opening;

(c) an opening through said cap-like memb er extending as a tube into said first part for introducing air at atmospheric pressure into the container;

(d) means forming a chamber supported at said first part, said chamber interposed between the volume of concentrate and said tube, said chamber having a chamber outlet fixed near said outlet opening and a top inwardly spaced from said outlet opening, said chamber outlet being a size which will permit a free flow of air, whereby air will escape from said chamber, despite any property of said concentrate, to replace concentrate which is dispensed through said outlet opening in such a manner so as to maintain a constant head pressure in the interior of said container;

(e) a valve for controlling flow through said tube comprising

a first valve member at the top of said chamber and a second valve member on said tube cooperating with said first valve member to block flow through said tube when said first and second valve parts are in sealing relationship;

(f) means for effecting relative movement of said cap-like member with respect to said first part to cause movement of said first and second valve parts with respect to each other, comprising cooperating surfaces on said first part and said cap-like member for converting a relative rotation between said first part and cap-like member into a linear movement between said cap-like member and said first part; and

(g) means to prevent backflow of concentrate through said chamber and to said air inlet.

4,570,831
DISPERSING FEEDER

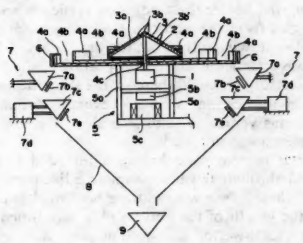
Asashiro Izumi, Kusatsu, and Masao Fukuda, Kouga, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jul. 7, 1982, Ser. No. 395,905

Claims priority, application Japan, Jul. 7, 1981, 56-101293[U]; Jul. 7, 1981, 56-101292[U]

Int. Cl.⁴ B65G *27/12*

U.S. Cl. 222—199 **9 Claims**



1. A dispersing feeder for dispersively feeding articles, supplied by a supplying apparatus, to a plurality of weighing machines where the articles are to be weighed, said feeder comprising:

a conically shaped projection for receiving said articles from the supplying apparatus, said projection comprising a turntable for receiving and temporarily retaining the articles supplied by the supplying apparatus, said turntable having a surface provided with a multiplicity of raised and recessed portions;

driving means for rotatively driving said turntable;

a dispersing path disposed concentrically with respect to said projection and having a plurality of exits formed on the outer circumference thereof, said dispersing path comprising a dispersing bowl disposed concentrically with respect to said turntable; and

an article transfer surface comprising said projection and said dispersing path a part of the surface of which being rugged, said turntable being rotated by said driving means to feed the articles to said dispersing bowl, and said dispersing bowl being oscillated to feed the articles into the weighing machines.

4,570,832
DISPENSING DEVICE IN THE FORM OF A CAULKING GUN

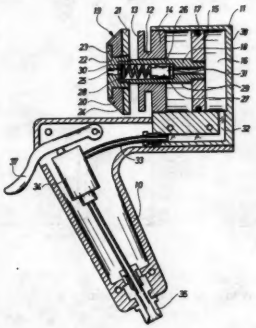
Mogens Kroger, Bronshoj, Denmark, assignor to M. Kroger Maskinfabrik A/S, Greve Strand, Denmark

Filed Mar. 22, 1984, Ser. No. 592,088

Claims priority, application Denmark, Mar. 23, 1983, 1318/83

Int. Cl.⁴ B65D *88/54*

U.S. Cl. 222—325 **4 Claims**



1. A pneumatic caulking gun comprising a supporting means for receiving an interchangeable caulk-containing cartridge, said cartridge having a dispensing nozzle at its forward end and a rim at the rearward end, the caulking gun including a dispensing means comprising a source of pressurized air, a driving piston, a piston plate, a sealing piston capable of engaging the rim of said cartridge to close said rearward end, the sealing piston including a central passage in communication with said source of pressurized fluid whereby fluid pressure urges the caulk from the cartridge, the central passage including a valve member adapted to open at a predetermined pressure of the pressurized fluid, the dispensing means being arranged such that said fluid pressure urges the sealing piston into engagement with the cartridge and subsequently opens said valve when the predetermined pressure is attained thereby allowing fluid to flow through the central passage to urge the caulk from the cartridge.

4,570,833
PUMPING SYSTEM

John A. Vanderjagt, 1395 Glen Oaks, Memphis, Tenn. 38117

Filed Aug. 26, 1983, Ser. No. 526,906

Int. Cl.⁴ B65D *88/54*

U.S. Cl. 222—333 **11 Claims**

1. A closed pumping system for liquid chemicals and the like comprising:

(a) a container having an interior for holding chemicals and the like, said container including a wall defining said interior and having a first opening and a second opening therethrough;

(b) outlet means attached to said wall in said second opening;

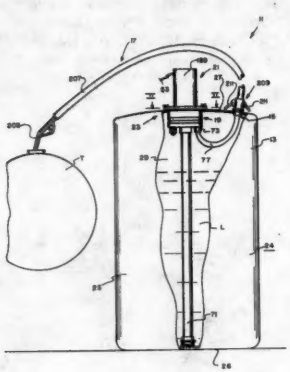
(c) dispensing means for dispensing chemicals and the like from said outlet means;

(d) pump means integrally attached to said wall in said first opening for pumping chemicals and the like from said container into said outlet means, said pump means being integrally attached to said wall in said first opening to form an integral part of said container;

(d) drive means for driving said pump means; and

(f) detachable means for detachably coupling said drive means to said pump means from the outside of said con-

tainer for the operation thereof and for the subsequent removal of said drive means from said pump means leaving said pumping system in a closed condition with said pump means and said container intact.



4,570,834

APPARATUS FOR EXTRUDING A FILLET

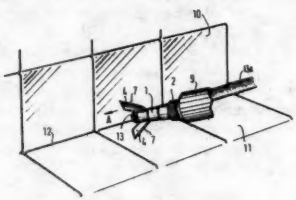
David J. Ward, Uttoxeter, England, assignor to Evode Limited, Stafford, England

Filed Sep. 19, 1983, Ser. No. 533,585

Claims priority, application United Kingdom, Sep. 23, 1982, 8227197; Oct. 15, 1982, 8229483; May 5, 1983, 8312330

Int. Cl.[4] B65D *35/38*

U.S. Cl. 222—566 **7 Claims**



1. A device for applying a fillet of pasty material to a region between two adjacent surface parts, said device comprising;

an extrusion nozzle which has a downstream end that includes an extrusion orifice therein, and

a substantially planar, flexible, generally V-shaped guide means at said downstream end of said extrusion nozzle, said generally V-shaped guide means including first and second elongated wiping portions defining respective inner and outer edges and a collar portion defining an inner and an outer edge, the outer edge of said collar portion being curved and the inner edges of said elongated wiping portions, together with the inner edge of said collar portion, providing an open area therebetween, said guide means being located at said downstream end of said extrusion nozzle such that said extrusion orifice communicates with said open area; said first and second wiping portions of said generally V-shaped guide means being capable of flexibly contacting the respective two adjacent surface parts when said device is moved along the region therebetween to deposit a fillet of pasty material which has passed through said extrusion nozzle and out said extrusion orifice into said region, said collar portion shaping the outer surface of said fillet and said outer edges of said first and second elongated wiping portions preventing pasty material from depositing on said two adjacent surface parts.

4,570,835

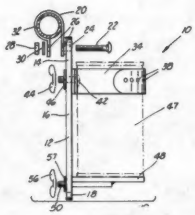
BICYCLE BEVERAGE HOLDER

William D. Criqui, 900 Buchanan, 67501, and Larry L. Smith, 129 W. 24th St., both of Hutchinson, Kans. 67501

Filed Feb. 29, 1984, Ser. No. 584,925

Int. Cl.[4] B62J *11/00*

U.S. Cl. 224—36 **1 Claim**



1. A beverage container holder for mounting on a bicycle handle bar and the like, the holder comprising:

a back plate having an upper portion, a center portion with a strap adjustment slot along the length of the center portion, and a lower portion having a bottom plate adjustment slot along the length of the lower portion;

a "U" shaped clamp attached to the upper portion of the back plate and having a threaded bolt received through an aperture in the upper portion of the back plate and received through a pair of apertures in the ends of the clamp, the clamp adjustably mounted on the back plate and adapted for securing the holder to the handle bar and allowing the holder to be adjusted vertically and at various angles from the vertical, the clamp suspending the back plate downwardly from the handle bar;

strap means attached to the center portion of the back plate and adjustably mounted thereon, the strap means adapted for receiving various sizes of beverage containers, the strap means vertically adjustable along the length of the strap adjustment slot; and

a horizontal bottom plate having a threaded end portion received through the bottom plate adjustment slot and secured thereto by a wing nut, the bottom plate adjustable along the length of the bottom plate adjustment slot for raising and lowering the bottom plate and resting the beverage container on the top thereof.

4,570,836

FISH STRINGER

Ronnie D. Mayo, 1114 S. Petit, Hominy, Okla. 74035

Filed Jun. 21, 1984, Ser. No. 623,039

Int. Cl.[4] A01K *65/00*

U.S. Cl. 224—103 **1 Claim**

1. A casing means comprising:

a first elongated U-shaped element;

a pair of complimentary aligned angularly extending slots in the side wall of said first elongated U-shaped element having their inner ends closed and the outer ends opened;

a second elongated U-shaped element forming a trough sufficiently large to receive said first elongated U-shaped element;

pivot menas connecting one end of each of said first and second elongated U-shaped element;

a second pair of angularly extending slots having their inner ends closed and the outer ends open and aligned with said angular slots in said first elongated U-shaped element, said second angularly extending slots sloping back toward said pivot means such that the open ends of said second pair of

slots are closer to said pivot means than are said closed ends;

a locking pin means freely slidable within the aligned slots;

a helical spring means retained within said first elongated U-shaped element;

spear means secured to the casing means and movable independently with respect thereto, the spear means being adapted for insertion through and withdraw from the open end of the first elongated U-shaped element;

said spear means having a notch opening in one side thereof such that when it is inserted against said helical spring that said locking pin means is engagable with said notch, said helical spring means urging said spear outwardly thus securing the locking engagement between said locking pin means and said spear means;

cord means extending between the spear means and one of said elongated U-shaped elements.

4,570,837

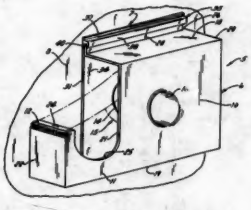
ADHESIVE TAPE DISPENSING HOLDER

Martin P. Belokin, Denton, Tex., assignor to Martin Paul, Inc., Denton, Tex.

Filed Aug. 30, 1984, Ser. No. 645,791

Int. Cl.[4] B26F *3/02*

U.S. Cl. 225—42 **3 Claims**



1. A dispensing holder for a roll of adhesive tape, adapted for detachable securement to an upright substantially flat supporting surface, characterized by:

A. a one-piece body that has front and rear ends and opposite sides, said body having a substantially flat upright side wall at one side thereof and being open at its other side, and further having

(1) a substantially cylindrical protuberance intermediate its front and rear ends projecting axially from said side wall towards said other side of the body, for rotatably supporting a roll of adhesive tape,

(2) top and bottom walls, respectively spaced above and below said protuberance, each projecting sidewardly from said side wall to have a free edge at said other side of the body, said bottom wall projecting forwardly a substantial distance beyond the front end of said top wall,

(3) an upward projecting on the front end of said bottom wall that defines an upwardly projecting tape cutting edge which is spaced a substantial distance below the level of the front end of the top wall,

(4) an edgewise vertically projecting flange along said free edge of each of said top and bottom walls, both of said flanges being substantially contained in a plane that is parallel to said side wall, and each said flange

(a) being elongated from front to rear of the body and

(b) being lengthwise parallel to the other and projecting edgewise oppositely to said other, and

(5) a rear wall spaced to the rear of said protuberance, said rear wall being connected with the respective rear ends of said top and bottom walls and projecting from said side wall sidwardly beyond said plane to have a marginal portion adjacent to said plane which defines a forwardly facing abutment surface; and

B. a substantially rectangular one-piece closure member having opposite front and rear edges and having opposite straight and parallel top and bottom edges, said closure member further having

(1) an outer flat surface which is adherently securable to a flat upright supporting surface,

(2) an opposite inner surface which is substantially flat,

(3) a vertical cross-section that is uniform along its length from its front edge to its rear edge, and

(4) elongated ledges that extend lengthwise along said top and bottom edges, said ledges

(a) being lengthwise parallel to one another and

(b) overlying said inner surface in inwardly spaced relation thereto,

said ledges being opposingly engageable over said flanges for connecting the closure member to said body in forwardly and rearwardly slidable relation thereto, the rear edge of said closure member being engageable with said abutment surface to define a rearward limit of sliding of the closure member relative to the body at which the closure member extends across said protuberance to confine a roll of tape thereon and from which the body cannot move forward relative to the closure member as tape is drawn forwardly from said roll toward said cutting edge.

4,570,838

AMPOULE OPENER

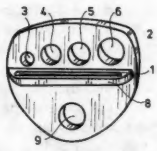
Róbert Szemere; József Majoros, and Ferenc Cséve, all of Budapest, Hungary, assignors to Magyar Optikai Müvek, Budapest, Hungary

Filed Sep. 12, 1983, Ser. No. 531,915

Claims priority, application Hungary, Sep. 14, 1982, 2923/82

Int. Cl.[4] C03B *33/06*

U.S. Cl. 225—93 **3 Claims**



1. An ampoule opener which comprises:

a flat elongate body with rounded ends and tapering from one end toward another and which can be held in a hand of a user said body being provided with a row of holes of different sizes graduated from a small diameter proximal to a small end of said body to a large diameter at a large

end of said body, said holes being adapted to accommodate heads of ampoules of different sizes; and

extending along said row and seated at a longitudinal edge of said body, an elongated ampoule scorer of ceramic material having converging flanks defining a scorer edge converging away from said body.

4,570,839

PRESS

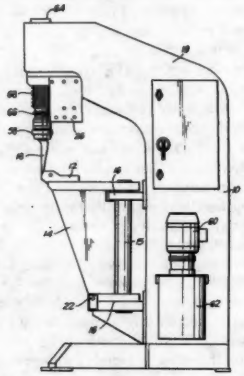
Gordon C. Cox, Rushden, and Peter Shorrock, Bedford, both of England, assignors to Leslie Hartridge Limited, Buckinghamshire, England

Continuation of Ser. No. 379,485, May 18, 1982, abandoned. This application Dec. 28, 1984, Ser. No. 687,483

Claims priority, application United Kingdom, Oct. 6, 1981, 8130160; Mar. 24, 1982, 8208617

Int. Cl.[4] B21J *15/28*; B23Q *11/00*

U.S. Cl. 227—1 **12 Claims**



1. A press comprising:

(a) a frame;

(b) an anvil support provided on said frame;

(c) a moveable punch carrier provided on said frame;

(d) drive means on said frame having a working part which is arranged to urge said moveable punch carrier in a direction towards said anvil support;

(e) means, being part of said press, defining two ends of travel between which said working part is moveable to move said punch carrier towards and away from said anvil support, said punch carrier being connected to said working part so that, throughout the length of said travel, said punch carrier and said working part move together;

(f) a limit switch connected to said drive means and switchable from a first condition in which said drive means are prevented from exerting a working force on said punch carrier to a second condition in which it enables said drive means to exert a working force on said punch carrier in said direction;

(g) switch means of said limit switch positioned to detect whether said working part, as the latter moves to bring said punch carrier closer to said anvil support, has reached a position where the remaining available travel for said working part is less than a finger's width, and to cause said limit switch to be switched from said first condition to said second condition when it detects that said working part has reached said position; and

(h) adjustment means between said punch carrier and said working part to enable the position of said punch carrier relative to said working part to be adjusted towards and away from said anvil support.

4,570,840

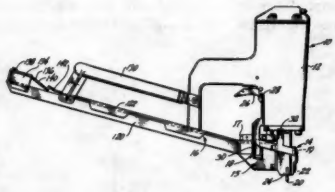
NAILING GUN

William T. Bull, 3133 Telegraph Rd., Fillmore, Calif. 93015

Filed Jan. 27, 1983, Ser. No. 461,681

Int. Cl.[3] B25C *1/02*

U.S. Cl. 227—8 **19 Claims**



1. For use with a nailing gun having a reciprocating driver to drive nails into a workpiece, an improvement comprising:

(a) a magazine having a pair of spaced-apart rails for serially feeding loose nails by gravity;

(b) a prechamber assembly including means defining a channel for serially feeding loose nails by gravity from the magazine, a nail head fence above the channel to engage nail heads and prevent trailing nails from riding under preceding nail heads in the channel, the nail head fence including a flat, continuous member above the channel and means to adjust the spacing of the member from the channel;

(c) means on the prechamber for arresting nails and preventing them from moving in a direction opposite nail feed upon nail driving by the driver; and

(d) a nose having a firing chamber aligned with the driver and in communication with the channel of the prechamber assembly for serially receiving nails from the prechamber assembly.

4,570,841

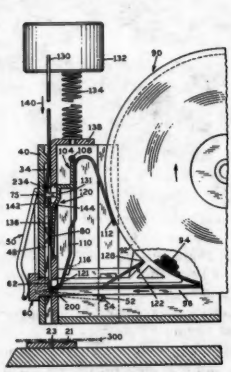
STAPLE FORMING AND DRIVING MACHINE

Paul Olesen, Bellmore, N.Y., assignor to Swingline, Inc., Long Island City, N.Y.

Continuation of Ser. No. 381,051, May 14, 1982, abandoned. This application Jun. 23, 1983, Ser. No. 506,991

Int. Cl.[4] B25C *5/04, 5/15*

U.S. Cl. 227—95 **18 Claims**



1. A staple forming and driving tool including a cartridge from which staple wires are fed as a belt normally oriented in a substantially horizontal plane, formed into staples and driven as staples into workpieces having upper and lower surfaces comprising

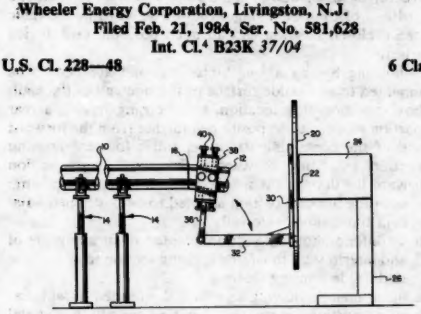
(a) a base;
(b) a stationary staple head mounted above the base and spaced therefrom a distance to accommodate the workpiece; said staple head including a stationary vertical head piece;
(c) a vertical sheath mounted adjacent to the vertical head piece and spaced therefrom by spacer lug means positioned to provide a passageway between said head piece and sheath;
(d) an opening in the vertical head piece for receiving staple wires;
(e) a second opening in the sheath;
(f) spring means engaging the vertical head piece and the sheath for urging the vertical head piece and the sheath against the spacer means;
(g) retractable forming block means positioned partially in the passageway and partially in the second opening, said block means being capable of retracting away from the vertical head piece against said spring means;
(h) reciprocal staple forming means positioned in said passageway for reciprocation from the upper surface of the workpiece to a position in the passageway; and
(i) driving means for driving the forming means downward including
(i) positive drive means for driving the forming means a portion of its downward travel to form the staple from a staple wire
(ii) frictional non-positive drive means for driving the forming means during a later portion of its travel after formation of the staple until the forming means engages the upper surface of the workpiece;
(j) driver blade means for driving the formed staple into the workpiece; and
(k) staple belt cartridge feed means for feeding one at a time the lead wire of the belt to the forming means which feed means includes guide means to guide the belt in its substantially horizontal movement to prevent vertical movement of that portion of the belt remaining after each staple wire is removed by the forming means.

4,570,842

CONDUIT WELD POSITIONER WITH ARC LENGTH ADJUSTOR

David J. Gregorious, Canaseraga; Roger F. Wilcox, Hornell, and Roland R. Burr, Dalton, all of N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 21, 1984, Ser. No. 581,628
Int. Cl.[4] B23K *37/04*
U.S. Cl. 228—48 **6 Claims**



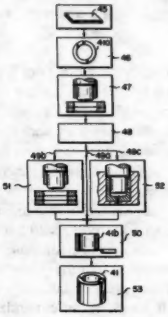
1. A conduit weld positioner for positioning two conduit portions extending at an angle to each other, said positioner comprising a turntable adapated to rotate about a central axis, means for grasping one of said conduit portions, first support means extending from said turntable in a spaced relation to said axis, and second support means connected at one end to said grasping means and at the other end to said first support means for movement between a first position in which the center of said grasping means coincides with said central axis, to a position angularly spaced from said first position to permit tilting of said grasping means relative to said turntable to align said portions in a predeterminted position.

4,570,843

METHOD FOR MANUFACTURING ANODE CYLINDERS OF ELECTRON TUBES

Hikaru Matsuzaki, Yokohama, and Toshiyuki Matsuzaki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 336,407, Dec. 31, 1981, abandoned.
This application Feb. 24, 1984, Ser. No. 582,856
Claims priority, application Japan, Jan. 14, 1981, 56-3111; Jan. 20, 1981, 56-6693; Jan. 20, 1981, 56-6696
Int. Cl.[4] B21C *37/08, 37/22;* **B21D** *22/28*
U.S. Cl. 228—151 **9 Claims**



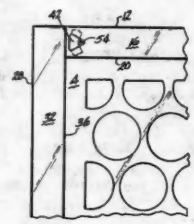
1. A method for manufacturing an anode cylinder of a magnetron comprising the sequential steps of:
(a) curving a rectangular copper plate member having opposing end faces and a given thickness to form a substantially cylindrical primary workpiece of a predetermined outer diameter and a seam, said seam having a gap defined between the opposing end faces of the curved plate member;
(b) forcing said cylindrical primary workpiece in a first reduction step, into and through at least one first reduction die of the type having an inner diameter less than the diameter of said primary workpiece to reduce the outer diameter of said primary workpiece to thus reduce the defined gap;
(c) cooling said primary workpiece; and
(d) forcing, during a second reduction step, said primary workpiece into a second reduction die having an inner diameter less than the outer diameter of said primary workpiece to form a secondary workpiece with a diameter less than the diameter of said primary workpiece achieved during said first reduction step, said second reduction step including the steps of (i) fitting the primary workpiece on a punch and die-and-knockout assembly, (ii) pushing the primary workpiece into the second reduction die by the punch to reduce the diameter of the primary workpiece, and (iii) applying a compressive force, in axial alignment with said seam, to said primary workpiece by relative closing movement between said punch and die-and-knockout assembly, said axial compression force causing metal flow to be created thereby removing the defined gap and closing the seam; and
(e) sealing the closed seam of the secondary workpiece to form the anode cylinder.

4,570,844

PAPERBOARD FRAME WITH LOCKABLE CORNERS

Lawrence S. Wysocki, Chicago, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 5, 1984, Ser. No. 658,404
Int. Cl.[4] B65D 5/00, 5/26
U.S. Cl. 229—16 D 4 Claims



1. A frame formed from a one-piece paperboard blank, said frame comprising:

(a) a back wall panel;

(b) first and second opposed pairs of framing panels foldably connected to edges of said back wall panel;

(c) each framing panel in said first and second pairs thereof including an outer side wall panel foldably connected to said back wall panel, a front wall panel foldably connected to said outer side wall panel, an inner side wall panel foldably connected to said front wall panel, and a glue panel foldably connected to said inner side wall panel, said glue panel being adhered to said back wall panel, each of said framing panels being foldable between a collapsed condition wherein said outer side wall panels and said front wall panels are substantially coplanar and overlie said back wall panel, to an expanded condition wherein said outer and inner side wall panels are substantially perpendicular to said back wall panel and said front wall panels are spaced apart from and substantially parallel to said back wall panel

(d) a locking tab formed at end portions of selected ones of said framing panels whereby there is one locking tab formed at each corner of said frame, each of said locking tabs being adapted to overlap an end portion of the top wall panel on the adjacent framing panel when said framing panels are in their expanded condition; and

(e) securement means for securing said locking tabs in overlapping relationship to said top wall panels of said adjacent framing panels whereby said frame is locked in said expanded condition.

4,570,845

CARTON CLOSURE RELEASABLE BY DEFORMATION

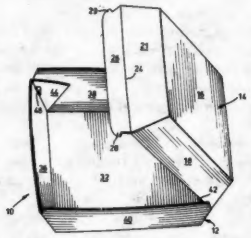
Charles J. Hall, Brampton, Canada, assignor to Dixie Canada Inc., Ontario, Canada

Filed Nov. 23, 1984, Ser. No. 674,422
Int. Cl.[4] B65D 5/22
U.S. Cl. 229—33 8 Claims

1. A box comprising:

a base portion having a front panel and two side panels each joined with the front panel at an angled corner, and recess means between the front panel and each side panel at the respective corners,

and a lid portion having a normally flat front panel from which two locking tabs extend in the plane of the panel and constitute extensions of the panel in opposed directions, each tab being adapted to engage in a respective recess means when the lid portion is closed against the base portion, said front panel of said lid portion being resiliently deformable by finger pressure applied between the tabs, to assume a curved shape in which the direct



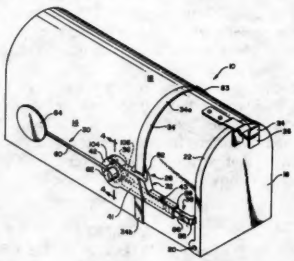
distance between the tabs decreases, thereby withdrawing the tabs from engagement in the recess means.

4,570,846

MAILBOX SIGNALLING DEVICE

Richard T. Morgrey, 913A N. Beach Rd., Bow, Wash. 98232

Filed Dec. 18, 1984, Ser. No. 683,262
Int. Cl.[4] A47G 29/12
U.S. Cl. 232—35 9 Claims



1. A signal device for a mailbox comprising a main containing structure with a sidewall and a door which is mounted at a forward end of the containing structure so as to be movable between a closed position and an open position, said device comprising:

a. a housing having a lengthwise axis and adapted to be mounted to an outside surface of the sidewall of the mailbox at a mounting location, said housing having a rear portion adapted to be positioned further from the forward end of the containing structure, and a forward housing portion extending forwardly from said rear portion toward the door of the mailbox, said housing comprising:

i. an inside housing section adapted to be positioned adjacent the mailbox sidewall;

ii. an interior housing section adapted to fit alongside of and interfit with the inside housing section so as to close said inside housing section;

b. a signal member having a pivot end mounted to said rear housing portion for rotation about a generally horizontal axis of rotation, and a signal end spaced from the axis of rotation, said signal member being movable about said axis of rotation between a down non-signalling position and an up signalling position;

c. a locating member connected to the pivot end of the signal member and having a locating element;

d. an actuating member extending along said lengthwise axis and mounted in the forward housing portion for limited fore and aft movement between a rear hold position and a forward release position, said actuating member being positioned adjacent a lengthwise extending wall portion of

said housing, said actuating member having a forward contact surface adapted to engage a side edge portion of the mailbox door when the door is in its closed position;

e. said actuating member and said housing wall portion having cooperating stop means comprising a stop recess formed in one of the housing wall portions and the actuating member, and a stop member mounted to the other of the housing wall portion and the actuating member and positioned in the stop recess for limited fore and aft movement to limit movement of the actuating member between said hold position and said release position;

f. a catch member mounted to the rear end of the actuating member and having a catch position where it engages the locating element of the locating member to hold the signal member in its nonsignalling position when the actuating member is in its hold position, and having a release position to permit said signal member to move to its signalling position when the actuating member is in its release position;

g. at least one of said actuating member and said housing wall portion defining a spring recess to receive an actuator spring, said housing having a first spring engaging portion to engage said actuator spring, said actuating member having a second spring engaging portion to engage said actuator spring in a manner to urge said actuating member to its release position;

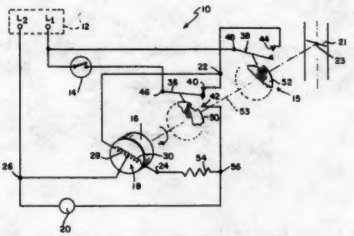
h. a mounting strap adapted to be connected to upper and lower portions of said exterior housing section and to extend around the mailbox to hold the signalling device substantially stationary at the mounting location and to hold the exterior housing section in closing engagement with the inside housing section.

4,570,847

FLUE DAMPER CONTROL SYSTEM

Michael T. Clouser, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Oct. 24, 1984, Ser. No. 664,249
Int. Cl.[4] F23L *11/00*
U.S. Cl. 236—1 G **13 Claims**



13. A control system for controlling a flue damper in the flue of a furnace, the control system comprising

a voltage source having a first and second potential,

thermostatic means for sensing ambient temperature, the thermostatic means including a switch operable in response to sensed ambient temperature,

a motor for moving the flue damper between a closed position and an open position, the motor including a motor coil assembly having a first terminal, a second terminal, a center tap terminal, a first winding coupled to the first terminal and the center tap terminal, and a second winding coupled with the second terminal and the center tap terminal,

first energization path means for coupling the first potential of the voltage source to the first terminal of the motor coil assembly to set up an electromagnetic flux in the first winding to actuate the motor to move the flue damper from its closed position toward its open position, the first energization path means including, in series, the thermostatic means and a first path switch for interrupting the flow of current through the first energization path,

second energization path means for coupling the first potential of the voltage source to the first terminal of the motor coil assembly to maintain the electromagnetic flux in the first winding, the second energization path means including a second path switch for interrupting the flow of current through the second energization path,

a third energization path means for coupling the first potential of the voltage source to the second terminal of the motor coil assembly to set up an electromagnetic flux in the second winding, the third energization path means including, in series, the thermostatic means and a third path switch for interrupting the flow of current through the third energization path means, and

means for actuating at least one of the first, second, and third energization path means to control movement of the flue damper, the actuating means including

means for selectively actuating the first energization path means to cause the flue damper to move toward its open position, and

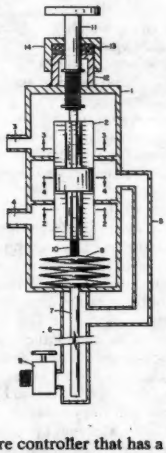
means for selectively activating the second and third energization path means to set up an electromagnetic flux in each of the two windings of the motor coil assembly so that said fluxes counteract one another thereby disabling the motor to stop movement of the flue damper.

4,570,848

AUTOMATIC BATH WATER TEMPERATURE CONTROL

Norvel J. McLellan, 1002 N. Main St., Pleasanton, Tex. 78064

Filed Feb. 1, 1984, Ser. No. 575,909
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.21 **1 Claim**



1. A water temperature controller that has a two port valve with an inlet for cold water and an inlet for hot water and a pipe that carries the output water and a port to pass hot water and a port to pass cold water and the two ports have a common valve plug has a center section that is a solid bar and two end sections that are cross shaped bars that can pass water through the valve seats and the valve plug is connected to a bellows by a bolt on one end of the bellows and threads in a hole in one end of the valve plug and the bellows is connected to a sensor tube with the inside of the sensor tube and the inside of the bellows common and both are filled with liquid and the sensor tube is inside the pipe that carries the output water of the two port valve and the end of said pipe that is not connected to the two port valve has a hand operated valve connected to it and the end of the valve plug that is not connected to the bellows has a square hole in it into which a square rod is inserted and

the square rod is attached to a handle that can be turned to adjust the temperature of the output water.

4,570,849

FAN DRIVE, PARTICULARLY FOR COOLING INSTALLATION OF VEHICLES

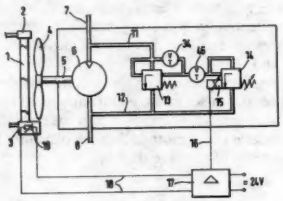
Thomas Klaucke, Renningen, and Franz Pigisch, Ditzingen, both of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,206

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341795

Int. Cl.[4] F01P *7/02*

U.S. Cl. 236—35 **20 Claims**



1. A fan drive suitable for a cooling installation of a vehicle, comprising:

(a) a hydraulic motor which is actuated by a pressure medium;

(b) a bypass for detouring the flow of pressure medium around the hydraulic motor;

(c) a control valve which regulates the flow of pressure medium to the bypass and to the hydraulic motor wherein said control valve comprises

a control piston for opening and closing said bypass and having a central bore,

an insert upon which the central bore of the control piston is slidingly arranged so as to form a seal,

a front surface of the control piston facing the direction of closing said bypass which is acted upon by the pressure medium,

a back surface of the control piston facing away from the direction of closing said bypass which is also acted upon by the pressure medium wherein the pressure acting on the front side of the control piston is the full pressure of the pressure medium called the high-pressure, and the pressure of the pressure medium acting on the back side of the control piston is called the control pressure,

a control spring for biasing the control piston in the direction of closing said bypass, and

a control cylinder for slidably containing the control piston which is divided by said piston into a high-pressure section in front of said front surface and a control chamber in back of said back surface;

(d) a pilot valve, arranged in said insert, which functions to regulate said control pressure; and

(e) an electromechanical servo element for actuating said pilot valve.

4,570,850

MODULAR CEILING AIR CONTROL DEVICE

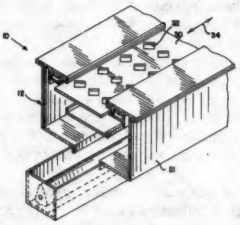
John McDermott, Elk Grove Village, Ill., assignor to MCD Enterprises, Inc., Bensenville, Ill.

Filed Apr. 23, 1984, Ser. No. 603,111

Int. Cl.[4] F24F *7/00*

U.S. Cl. 236—49 **12 Claims**

1. An air control device for controlling air flow into a room comprising a housing having an inlet and an outlet, a fixed plate extending across said inlet and having a plurality of spaced openings therein, a movable plate slideable on said fixed plate and having openings spaced and corresponding to the spaced openings in said fixed plate and means for moving said movable plate as a function of room temperature, said means for moving including a spring extending from said movable plate to said housing for biasing said movable plate relative to said fixed plate with the spaced openings of the two plates



offset from one another to stop air flow therethrough, and a temperature sensitive means acting against said spring to at least partially align said spaced openings of the two plate at a desired temperature to provide air flow therethrough, heating means in said housing for heating air flowing through said housing and means responsive to actuation of said heating for moving said movable plate to a maximum air flow position.

4,570,851

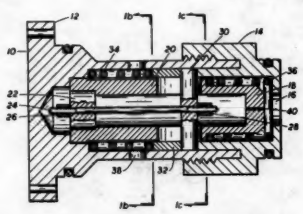
TEMPERATURE REGULATING, PRESSURE RELIEF FLOW VALVES EMPLOYING SHAPED MEMORY ALLOYS

John R. Cirillo, 226 Kohr Rd., Kings Park, N.Y. 11754

Filed May 7, 1984, Ser. No. 607,629

Int. Cl.[4] G05D *23/02*

U.S. Cl. 236—93 R **7 Claims**



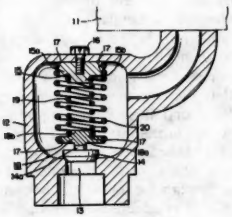
1. A temperature regulating, pressure relief valve comprising a hollow interior housing, normally opened entrance and exits ports within said housing for allowing fluids to flow through the interior of said housing, a closure device for said entrance port, an assembly for sliding movement within the interior of said housing affixed to said entrance port closure device, mechanical springs for movement of said sliding assembly, a shaped memory alloy wire assembly comprising wires held in tension within said sliding assembly, said shaped memory alloy wires contracting upon temperature increases of said fluids and thereby causing sliding movement in one direction of said assembly and said closure device resulting in the closing of said entrance port and the compressing of said mechanical springs for maintaining pressure upon said entrance port closure device, and said shaped memory alloy wires relaxing upon temperature decreases of said fluids and thereby resulting in sliding movement in an opposite direction of said assembly and said closure device resulting in the opening of said entrance port and the opposite compressing of said mechanical springs for maintaining pressure against closing said entrance port.

4,570,852

DRAIN VALVE

Ichizo Ohkata, Yokohama, Japan, assignor to Kato Hatsujo Kaisha, Ltd., Kanagawa, Japan

Filed Feb. 16, 1984, Ser. No. 580,638
Claims priority, application Japan, Jul. 6, 1983, 58-103871
Int. Cl.[4] F16K *17/38*
U.S. Cl. 236—93 R 1 Claim



1. A drain valve for a steam flow tube, comprising:

a hollow valve casing communicating with the steam flow tube and having a discharge port formed in a lower portion thereof,

a drain valve head with a valve stem, said drain valve head being positioned in communication with the discharge port of the hollow valve casing,

an upper retainer fixed to an upper inner wall of said hollow valve casing and composed of a large-diameter portion having spring retaining grooves formed in a circumference thereof and a small-diameter portion having spring retaining grooves formed in a circumference thereof, said large-diameter portion being concentrically superposed on said small-diameter portion,

a lower retainer provided integrally with said valve stem of said drain valve head and composed of a large-diameter portion having spring retaining grooves formed in a circumferene thereof and a small-diameter portion having spring retaining grooves formed in a circumference thereof, said small-diameter portion being concentrically superposed on said large-diameter portion,

said upper retainer and said lower retainer being opposed to each other,

a first spring made of a shape memory effect alloy, attached to inside positions between the opposed upper and lower retainers so as to have opposite ends of the first spring engaged in the spring retaining grooves in the small-diameter portions of the opposed upper and lower retainers, said first spring being adapted to urge said drain valve head in a direction in which said discharge port is to be closed, and

a second spring attached to outside positions between the opposed upper and lower retainers so as to have its opposite ends engaged in the spring retaining grooves in the large-diameter portions of the opposed upper and lower retainers, said second spring being adapted to urge said drain valve head in a direction in which said discharge port is to be opened,

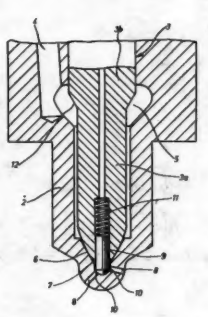
whereby said discharge port is automatically closed or opened by causing said drain valve head to ascend or descend by temperature differences which affect the first spring and the second spring to react in opposite directions within said hollow valve casing.

4,570,853

SELF-CLEANING FUEL INJECTION VALVE

Kurt Schmied, Denkendorf, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 536,980
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236046
Int. Cl.[4] F23D *14/50;* B05B *15/02*
U.S. Cl. 239—116 8 Claims



1. Fuel injection nozzle arrangement for an internal combustion engine, comprising:

a nozzle body;

an injection needle movably disposed in the nozzle body and engageable with a needle seat at the nozzle body,

a pocket reservoir formed at the downstream end of the needle seat, injection holes with different injection directions extending from the pocket reservoir such that a bottom surface of the pocket reservoir lies below a level at which the injection holes open into said reservoir, allowing fuel to be trapped in said reservoir following an injection cycle;

an abutment body movably disposed in the needle between a first position blocking the pocket reservoir and a second position freeing the pocket reservoir, said abutment body extending into an area of the reservoir adjacent to the injection holes to at least partially block said injection holes and to substantially fill said reservoir when said abutment body is in said first position;

abutment body biasing means for biasing said abutment body toward said first position blocking the pocket reservoir, and;

wherein said abutment body, injection needle and biasing means are configured so that said abutment body is removed to the second position prior to movement of the injection needle to begin the injection cycle, and wherein said abutment body is moved to the first position immediately following the injection cycle to force the trapped fuel from the reservoir.

4,570,854

AGRICULTURAL AERIAL WATER SPRAYER

Hans Wernhart, 12147 Pony Express La., Bakersfield, Calif. 93306

Filed Mar. 28, 1984, Ser. No. 594,213
Int. Cl.[4] B05B *3/18*
U.S. Cl. 239—189 3 Claims

1. An agricultural aerial liquid spraying system comprising:

a retrieval vehicle;

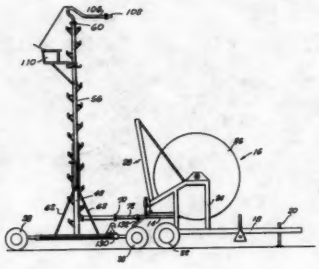
a movable base member including wheels which are adjustable widthwise to move between rows of agricultural products;

a relatively long fixed length tower having an interior bore running on the vertical axis of said tower from and includ-

ing an end connected to said base member and said tower terminating in an upper end remote said base member, said tower being pivotable from an operating vertical position to a generally horizontal transporting position;

a nozzle means rotatably mounted on said upper end of said tower for dispensing liquid generally normal to said vertical position;

liquid directional flow control means including a seat vertically fixably mounted upon said tower in the vicinity of said nozzle, said seat being rotatable around said tower



and said seat adapted to hold a person elevated near said upper end; and

a directional control arm secured to said nozzle means and extending downward terminating near said seat for manipulating by said person about the axis of said tower; and

coupling means uniting said vehicle with said tower whereby liquid may pass from said vehicle to said interior bore of said tower for presentation to said nozzle means for discharge therefrom and whereby said movable base member may be retrieved to said vehicle.

4,570,855

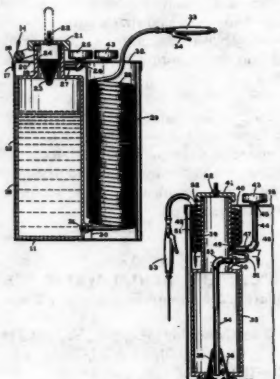
SPRAYING APPARATUS

Taylor C. Johnston, P.O. Box 55-7544, Miami, Fla. 33155

Filed Apr. 13, 1984, Ser. No. 600,079

Int. Cl.[4] A62C *13/60*

U.S. Cl. 239—195 **9 Claims**



1. A spraying apparatus comprising:

a housing;

a first cylinder for liquid extending upright in said housing and having a top end cap above said housing, a one-way check valve in said end cap for passing pressurized air into said cylinder above the liquid therein;

a partition extending cylindrically up inside said housing;

a flexible first hose operatively connected to the interior of the first cylinder adjacent its lower end and extending up inside said partition in closely spaced helical turns and passing through the top of said housing, a first discharge nozzle connected to said hose outside said housing;

a second cylinder for particulate material such as powder extending upright in said housing, said second cylinder having a reduced diameter segment at its upper end inside said housing, an annular partition extending around said reduced diameter segment of the second cylinder and defining therewith an annular space, a top end cap on said reduced segment of the second cylinder above said housing, a one-way check valve in said last-mentioned end cap for passing pressurized air into said second cylinder above the particulate therein;

and a flexible second hose having opposite ends, one of which is located in the interior of the second cylinder at the lower end of the latter, said second hose extending in closely spaced helical turns up inside said annular spaced and passing through the top of said housing, and a second discharge nozzle connected to the opposite end of said second hose outside said housing.

4,570,856

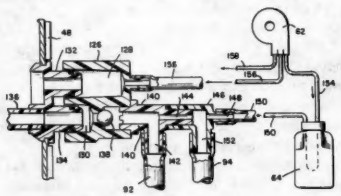
LIQUID AND DETERGENT MIXING CHAMBER AND VALVES

Hugh F. Groth, Richfield, and John M. Collins, Sagamore Hills, both of Ohio, assignors to Regina Corporation, Rahway, N.J.

Filed Mar. 2, 1984, Ser. No. 585,547

Int. Cl.[4] F16K *11/14*; B05B *7/26*

U.S. Cl. 239—310 **19 Claims**



1. A cleaning device comprising:

a spray nozzle,

a mixing means for mixing water and cleaning fluid having an outlet connected to said spray nozzle, a fitting providing a water inlet and a cleaning fluid inlet to said mixing means, said inlets being separate from each other;

a pressurized source of water connected to said water inlet;

a pressurized source of cleaning fluid connected through said fitting to said cleaning fluid inlet; and

a passage in said fitting communicating pressurized water from said pressurized water source to said cleaning fluid inlet.

4,570,857

FLOW REGULATOR AND SPRAY NOZZLE INCLUDING SAME

Peretz Rosenberg, POB 3120, Ntehanya, 42 130, Moshav Beit Shearim, Israel

Filed Aug. 19, 1983, Ser. No. 524,609

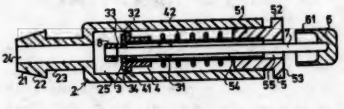
Claims priority, application Israel, Aug. 23, 1982, 66608

Int. Cl.[4] B05B *1/26, 1/30*

U.S. Cl. 239—382 **5 Claims**

1. A spray nozzle comprising: a body member having a fluid inlet at one end and a fluid outlet at the opposite end; a fixed sleeve fixed within said body member and formed with an opening serving as a metering passageway for the flow of fluid

therethrough; a displacable sleeve coaxial with and displacable with respect to said fixed sleeve so as to vary the effective size of said metering passageway, and thereby to vary the rate of flow of fluid therethrough; biassing means for biassing said displacable sleeve in the direction to enlarge said metering passageway; a flow sensor element carried by said displacable sleeve and impinged by the fluid flowing through said body member so as to displace said displacable sleeve in the direction of restricting said metering passageway; a nozzle secured



to the outlet end of said body member downstream of said metering passageway and formed with an outlet orifice through which the fluid issues in the form of a jet; a stem passing through said fixed and displacable sleeve and movable independently of said sleeves in the axial and lateral directions with respect thereto; a deflector mounted on said stem so as to be impinged by the jet issuing from said orifice and movable with said stem axially and laterally with respect to said orifice; and limiting means limiting the movements of the stem and the deflector with respect to the nozzle orifice.

4,570,858

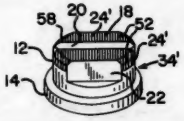
COATED SPRAY NOZZLE TIPS

Dennis W. Bintner; Joseph B. Ryan, Jr., both of Des Moines, Iowa, and Mark H. Bartel, Lexington, Tenn., assignors to Delavan Corporation, West Des Moines, Iowa

Filed Jan. 11, 1983, Ser. No. 457,196

Int. Cl.[4] B05B *1/00*

U.S. Cl. 239—390 **8 Claims**



1. A spray tip for a fluid spray nozzle, said tip being formed of a base material and having a spray orifice in a substantially flat exterior face thereon for metering and spraying the fluid, wherein the improvement in said tip comprises:

a colored coating printed on, adhering to and covering the base material of said flat exterior face, said base material of said tip being free of said coating at said spray orifice so that said orifice is not impaired by said coating.

4,570,859

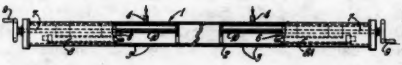
FOAM DISPENSER FOR GLASS MAT SUBSTRATE

Paul A. Klett, Newark; Shiv K. Bakhshi, Columbus, and Mark A. Granger, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 6, 1984, Ser. No. 576,999

Int. Cl.[4] B05B *1/32*

U.S. Cl. 239—455 **5 Claims**



1. A dispensing head for dispensing foam into a glass mat substrate comprising:

(a) an elongated chamber having an apertured wall facing said glass mat substrate, said elongated chamber being positioned across the width of said glass mat substrate;

(b) a conduit opening into said chamber for the introduction of a foam thereinto; and

(c) expandable means positioned within said chamber, said means being expandable to restrict flow of said foam material through said apertures, and said expandable means being moveable within said chamber across the width of said glass mat substrate to control the number of apertures through which the flow of foam is restricted to thereby control the width of foam applied to said glass mat substrate.

4,570,860

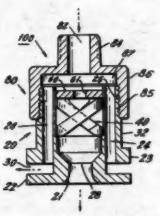
180° NOZZLE BODY HAVING A SOLID CONE SPRAY PATTERN

George F. Aprea, Dedham, and Werner P. Pohle, Lynn, both of Mass., assignors to Wm. Steinen Mfg. Co., Parsippany, N.J.

Filed Feb. 6, 1984, Ser. No. 577,176

Int. Cl.[4] B05B *1/34*

U.S. Cl. 239—478 **24 Claims**



1. A nozzle body having an inner and outer nozzle, said inner nozzle having an orifice to discharge fluid in a solid cone spray, said outer nozzle having a deflector plate to discharge fluid in a hollow cone spray that is adjacent to the solid cone spray; the inner nozzle has a center vane in axial alignment with said orifice; said outer nozzle has a plurality of openings that are located around the outer circumference of said inner nozzle and parallel to the axis of said inner nozzle and parallel to each other; said deflector plate is in a plane substantially perpendicular to the common axis of the inner and outer nozzle; said plurality of openings extend in a direction and are positioned substantially perpendicular to said deflection plate; said nozzle body having an inlet end and an outlet end; said orifice and said deflection plate located at said outlet end; said outer nozzle being constructed to permit fluid entering said plurality of openings to be discharged against said deflector plate, said inner nozzle being constructed to permit fluid entering said center vane to be discharged from said orifice; said center vane is located in an inner chamber with said plurality of openings located around the outer perimeter of said inner chamber.

4,570,861

METHOD OF AND ARRANGEMENT FOR ELECTROSTATIC SEPARATION OF PAPER- AND SYNTHETIC PLASTIC MATERIAL-CONTAINING MIXTURES

Helmut Zentgraf, Burghaun, and Günter Fricke, Bad Hersfeld, both of Fed. Rep. of Germany, assignors to Kali und Salz AG, Kassel, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,355

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1982, 3227874

Int. Cl.[4] B02C *23/08*

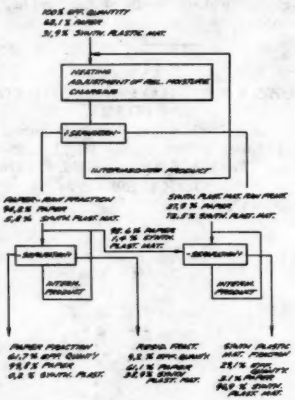
U.S. Cl. 241—24 **5 Claims**

1. A method of electrostatically separating paper- and synthetic plastic-containing mixtures, comprising the steps of

comminuting a paper- and synthetic plastic-containing mixture into particles with a width of substantially 3–4 mm and a length of substantially 10–20 mm;

triboelectrically charging the particles in an atmosphere with a relative moisture of between 5 and 20% at a temperature of between 25° and 80° C.;

feeding the triboelectrically charged particles into a free-fall separator with an electrostatic field of between 1 and 4 kV/cm, so that the triboelectrically charged particles fall



freely through the separator and under the action of the electrostatic field are deflected so that at a bottom of the separator a paper-enriched fraction is collected in the vicinity of a positive electrode, a synthetic plastic-enriched fraction is collected in the vicinity of a negative electrode, and an intermediate fraction is collected therebetween; and

supplying the intermediate fraction back into the free-fall separator.

4,570,862

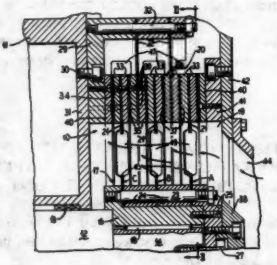
FLEXIBLE DISK REFINER AND METHOD

Edward C. Kirchner, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 12, 1983, Ser. No. 531,274

Int. Cl.[4] B02C *7/14*

U.S. Cl. 241—28 **13 Claims**



1. Apparatus especially useful for refining paper making stock, comprising:

means defining a working chamber for transit of the stock therethrough;

means defining a rotor and a stator in said chamber;

a plurality of axially spaced refining surfaces carried by said stator;

a plurality of axially spaced and axially resiliently flexible annular refining disks mounted at one of their edges on said rotor and carrying means providing refining surfaces at their opposed edges for coacting in a refining zone with the stator refining surfaces for refining the stock in transit through said working chamber and said refining zone;

stock flow equalizing ports through said disks; and

vane means cooperatively related to said ports for balancing the pressure on opposite sides of said disks.

4,570,863

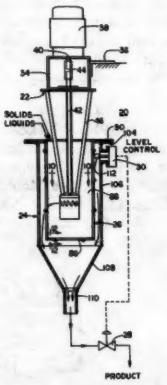
WET GRINDING MACHINE

Arthur C. Knox, Jr., 525 Purcell Ave., Cincinnati, Ohio 45205; Allan E. Hokanson, Springfield Township, Hamilton County, Ohio, and Anthony Witsken, 525 Purcell Ave., Cincinnati, Ohio 45205, assignors to C. Arthur Knox and Anthony Witsken, both of Cincinnati, Ohio

Filed Jan. 10, 1983, Ser. No. 456,825

Int. Cl.[4] B02C *23/36*

U.S. Cl. 241—33 **8 Claims**



1. A wet grinding machine which comprises a grinder head, an annular stator mounted on the grinder head, a rotor rotatably mounted in the grinder head, upright shearing blades on the rotor turnable inside the stator, there being a plurality of shearing slots in the stator opposed to the blades, each of the shearing slots sloping and overlapping adjacent shearing slots, whereby, as the rotor turns, each of the blades is constantly opposed to and addressing at least one of the shearing slots, the stator extending downwardly from the slots to an inlet opening spaced from the shearing slots, and means for turning the rotor to cause the rotor vanes to induce pumping of a slurry of large particles in liquid entering the stator through the inlet opening to cause the large particles to enter the shearing slots to be sheared by the blades against inner edges of the slots to form particles of reduced size, liquid discharged from the shearing slots recirculating through the inlet opening.

4,570,864

DISC CRUSHER

Ivan V. Genev; Stefan T. Bagarov; Evtim V. Genev; Boris Y. Drakaliiski; Marin P. Marinov, and Kosta Y. Kirilov, all of Sofia, Bulgaria, assignors to ISO "Metalurgkomplekt", Sofia, Bulgaria

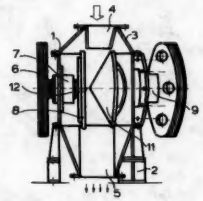
Filed Apr. 13, 1983, Ser. No. 484,647

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—252 **5 Claims**

1. In a disc crusher having a housing fitted on a supporting

frame and closed by a cover bearing an input tube, within the housing there being fitted a rotary disc and a rotary cone, mounted upon and coaxial with respective first and second driving shafts, the disc and cone having working surfaces forming a crushing zone between them, the improvement



wherein the rotary disc rotates about a first axis coincident with the axis of the first shaft and the rotary cone rotates about a second axis coincident with the axis of the second shaft, the second shaft axis intersecting the rotary disc at its center, the first and second shafts being horizontal.

4,570,865

COP SUPPLYING DEVICE

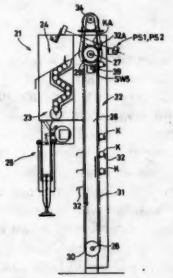
Tsukasa Kawarabashi, Kyoto, and Shinji Takahashi, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Japan

Filed Oct. 12, 1983, Ser. No. 541,095

Claims priority, application Japan, Oct. 13, 1982, 57-155425[U]

Int. Cl.⁴ B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **7 Claims**



1. A device for selectively transferring cops from a yarn spinning frame to a yarn winder comprising:

discrimination means for separating each of said cops into one of a first category and a second category based upon a predefined discrimination criterion;

first transportation means for transporting said cops from said spinning frame to said discrimination means;

storage means for storing cops of said first category;

delivery means for delivering cops of said first category from said discrimination means to said storage means;

second transportation means for transporting cops of said first category from said storage means to said winder;

wherein an uninterrupted supply of cops of said first category is available in said storage means for transportation to said winder.

4,570,866

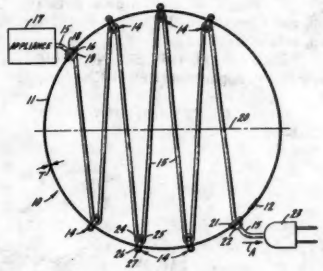
LINE RETRACTOR

Herbert M. Drower, Wilmette, Ill., assignor to Sealtran Corporation, Chicago, Ill.

Filed Apr. 8, 1985, Ser. No. 721,160

Int. Cl.⁴ B65H *75/36*

U.S. Cl. 242—47.5 **15 Claims**



1. A line retractor for storage and retraction of a long, flexible line, comprising:

a thin, flat, elongated strip spring member of tough, resilient, inelastic resin material having an arcuate configuration exceeding 180°;

a plurality of pulleys mounted on the spring member and projecting inwardly thereof at spaced locations, with all pulleys aligned in a common plane transverse to the spring member and with approximately equal numbers of the pulleys located on opposite sides of a centerline through the spring member; and

line anchor means to anchor a line to the spring member adjacent one end of the centerline, the line being extended from the anchor means back and forth across the centerline and around each pulley to store a substantial length of the line within the arc of the spring member.

4,570,867

DEVICE FOR SUCKING-UP AND HOLDING A THREAD

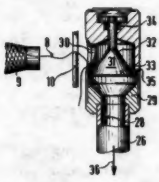
Karl-Heinz Kohlen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Aug. 5, 1983, Ser. No. 520,721

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1982, 3229329

Int. Cl.⁴ B65H *54/22, 67/08*

U.S. Cl. 242—35.6 R **7 Claims**



1. Device for sucking-in and holding a thread, comprising a suction body having a suction opening formed therein for sucking-in a thread in a given suction direction, and a controllable thread-clamping device disposed downstream of said suction opening in said given suction direction, said thread-clamping device being in the form of a pneumatic valve disposed in vicinity of said suction opening including a valve seat, and a valve disc being spring-loaded against said valve seat and being lifted off said valve seat by suction air flowing from said

valve seat and creating a suction flow through said suction opening and said pneumatic valve for sucking-in the thread and clamping the thread between said valve seat and said valve disc after the suction flow stops and said pneumatic valve is closed.

4,570,868

DISPENSER FOR ADHESIVE LABELS

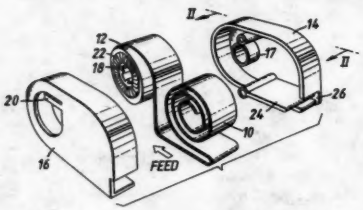
Christopher C. Wiggs, 64 Goldborough Crescent, Chingford, London, and Christopher J. C. Taylor, 117 Latchmere Rd., London, both of England

Filed Jan. 14, 1985, Ser. No. 691,075

Claims priority, application United Kingdom, Mar. 9, 1984, 8406190

Int. Cl.[4] B65H *19/00*

U.S. Cl. 242—55.53 **10 Claims**



9. A hand-held device for applying pressure-sensitive labels to a surface, comprising:

a body having an opening through which said labels are dispensed;

a roller carried by the body and adapted to be driven in rotation by movement of the device in contact with said surface;

a supply of web material in said body;

pressure-sensitive labels releasably disposed along said web;

a take-up spool receiving said web after removal of said labels;

a peel edge located adjacent said opening about which edge said web is constrained to suffer a change of direction in its travel before reaching the take-up spool, which change of direction separates the label from the web;

drive means interconnecting said roller and said take-up spool to drive said spool in rotation at substantially the same speed as the roller is rotated whereby the label is discharged through said opening at substantially the same speed as the device is moved over said surface.

4,570,869

SPOOL FOR RIBBONS, TAPES, ETC.

Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 649,224

Claims priority, application Japan, Jan. 4, 1983, 58-171062

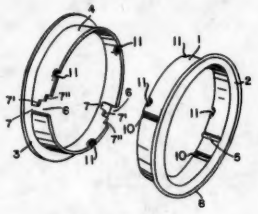
Int. Cl.[3] B65H *75/18*

U.S. Cl. 242—71.9 **8 Claims**

6. A spool for ribbons, tapes, string and the like, comprising

a plastic first cylinder having an outer cylindrical surface around which ribbon, or tape, or string may be coiled, an inner surface, and a projecting first flange along one edge, said inner surface having a series of evenly spaced-apart identical transverse ribs projecting inwardly therefrom,

an adjustable second cylinder having a second flange along one edge and a series of evenly spaced-apart identical openings extending in from the other edge, one for each said rib, each opening providing along one transverse side a series of steps in a stair-like form, with one of which one end of a transverse rib makes contact, the selection of which steps are engaged by the ribs determining the width between the two flanges of the assembled spool, and



securing means for holding said second cylinders in a selected position.

4,570,870

WEB FEED MECHANISM FOR FEEDING A WEB FROM A ROLL

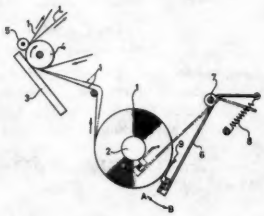
Kaoru Ito, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Oct. 23, 1984, Ser. No. 663,982

Claims priority, application Japan, Oct. 25, 1983, 58-164074

Int. Cl.[4] G11B *15/22*; B65H *23/06*

U.S. Cl. 242—75.4 **8 Claims**



1. A web feed mechanism for feeding a web under constant tension from a roll, comprising:

a web wound on a roll; a main carrier supported for movement toward and away from the roll;

a slide having a surface shaped and positioned for contacting the outer winding of the web roll; the slide being supported on the main carrier for sliding along a pathway tangential to the roll; the roll having a forward direction of rotation in which the web is let off the roll and the roll having a backward direction of rotation in which the web is taken up onto the roll; the slide being movable with respect to the main carrier in both the forward and backward directions of the roll, and those slide movements are tangential to the roll;

first biasing means for biasing the main carrier toward the roll; the first biasing means biasing the main carrier for biasing the slide against the outermost winding of the roll for the slide to apply drag to the outermost winding of the web; and

second biasing means for biasing the slide in the backward direction and with respect to the carrier, whereby as the web is let off the roll, the contact between the outermost winding and the slide drags the slide in the forward direction and increasingly charges the second biasing means for increasing the tension on the let-off portion of the web until the web slides with respect to the biased slide; the main carrier being movable along the pathway toward and away from the center of the web roll and the first biasing means biases the carrier toward the center of the web roll; the main carrier including a lever that is sup-

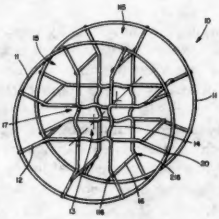
ported for hinged, swinging motion toward and away from the center of the web roll and the first biasing means biases the lever toward the center of the web roll; the slide including a drag element on the surface thereof facing the outermost winding of the web roll, and that drag element includes a friction face for contacting the outer winding for ensuring drag thereon; the drag element comprising a drag rubber; the contact surface of the drag rubber having a plane shape.

4,570,871

SUPPORT FOR THE WINDING OF PACKAGES OF WIRE

Rossano Compagnucci, Osimo, Italy, assignor to Ferriere Nord S.p.A., Osoppo and Silo S.p.A., Santa Maria Nuova, both of, Italy

Filed Oct. 31, 1984, Ser. No. 666,740
Claims priority, application Italy, Nov. 14, 1983, 83499 A/83
Int. Cl.[4] B65H *75/20*
U.S. Cl. 242—77.2 **20 Claims**



1. A support for winding wire and the like comprising continuous circumferential metallic rod elements,

a plurality of substantially U-shaped elements each formed of a bent rod having two ends positioned on a substantially radial axis to said circumferential metallic rod elements, and welded at both ends to one of said circumferential metallic rod elements, with neighboring U-shaped elements being welded to each other in correspondence with a central portion of said support to form a rocket portion, and

a plurality of cross-piece elements welded at their ends to at least partially corresponding U-shaped elements welded to said circumferential metallic rod elements.

4,570,872

SEAT BELT RETRACTOR

Harutoshi Tsujimura, Yokohama, and Ken Kamijo, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 25, 1983, Ser. No. 479,015
Claims priority, application Japan, Apr. 26, 1982, 57-69956
Int. Cl.[4] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **14 Claims**

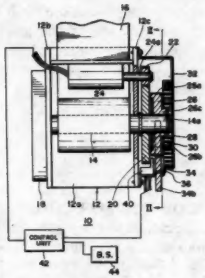
1. A seat belt retractor for selectively retracting and feeding a seat belt, comprising:

a belt take-up shaft on which said seat belt is retractable;

first means, comprising an electric motor, for rotating said belt take-up shaft in at least one of the belt retracting direction and the belt feeding direction when operated;

second means, comprising a first spring, for rotating said belt take-up shaft in the belt retracting direction when released; and

switch means for selectively operating said first and second means, said switch means including an inner structure comprising means, when actuated, for releasing said first spring to rotate said belt take-up shaft in the belt retracting direction and an outer structure which projects outwardly from the retractor so as to be easily manipulated from outside the retractor, said outer structure comprising a manually movable member for actuating said releasing means, wherein said first means further comprises a gear train which is arranged to transmit the motion of said electric motor to said belt take-up shaft, and in which said second means further comprises a motion transmitting mechanism which is constructed to wind said first spring



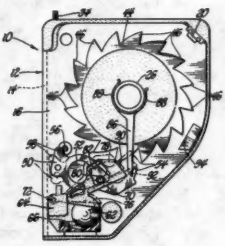
for storing therein energy when the belt take-up shaft is rotated in the belt feeding direction and to transmit a rotating motion created by the stored energy of the spiral spring to the belt take-up shaft to rotate the same in the belt retracting direction.

4,570,873

SENSOR SENSITIVITY REDUCER FOR DOOR MOUNTED RETRACTOR

Gary R. Kurtti, East Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 11, 1985, Ser. No. 690,739
Int. Cl.[4] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **2 Claims**



1. A seat belt retractor adapted for mounting on a vehicle door to wind and unwind the end of a belt having its other end mounted on the vehicle body inboard the occupant so that belt is unwound upon opening the door and rewound upon closing the door comprising:

a frame;

a reel rotatably mounted on the frame and having teeth carried thereby;

a lock bar mounted on the frame for movement into locking engagement with the reel to block belt unwinding rotation of the reel;

an inertia mass mounted on the frame and movable in response to acceleration;

a pilot pawl supported by the inertia mass at a normal position spaced from the teeth and spaced from the lock bar, said pilot pawl being movable by the inertia mass in response to a predetermined rate of acceleration to engage one of the teeth so that belt unwinding reel rotation causes further movement of the pilot pawl to move the lock bar

into locking engagement with the reel, and thereby block belt unwinding rotation of the reel; and

a blocking member friction drive coupled to the reel for rotation therewith and frictionally engaging with the pilot pawl upon unwinding rotation of the belt reel indicative of door opening movement to thereby impose a frictional force upon the pilot pawl resisting movement of the pilot pawl into engagement with the teeth by the inertia mass in response to occurrence of the level of acceleration induced by opening movement of the door, said frictional force being overcome upon occurence of a relatively greater level of acceleration acting on the inertia mass to thereby block the reel against further belt unwinding rotation.

4,570,874

TENSIONING DEVICE FOR COIL WINDING MACHINE

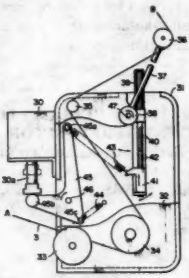
Shuji Takeda, Oume, Japan, assignor to TANAC Engineering Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,162

Claims priority, application Japan, Oct. 11, 1983, 58-157070[U]

Int. Cl.⁴ B65H *59/10*

U.S. Cl. 242—147 R **3 Claims**



1. A tensioning device for a coil winding machine wherein a wire is fed from a wire supply source to a coil winding station, comprising

a housing;

a main tension pulley rotatably supported by said housing;

a back tension lever swingably supported by said housing for applying a back tension to said wire, said wire being guided by said main tension pulley and back tension lever as said wire is fed from said wire supply source to said coil winding station;

a first back tension spring having one end connected to said back tension lever;

a second back tension spring having one end connected to said housing;

connecting means pivotably mounted on said housing, said connecting means coupling together the other ends of said first and second back tension springs; and

a control means coupled to said connecting means for selectively switching said connecting means between a first operating mode wherein the back tension applied by said back tension lever to said wire is determined by said first back tension spring, and a second operating mode wherein the back tension applied by said back tension lever to said wire is determined by said first and second back tension springs acting in series, the back tension applied to said wire when said connecting means is operating in said second mode being less than that applied to said wire when said connecting means is operating in said first mode.

4,570,875

AUTOMATIC TRAVERSING CONTROL

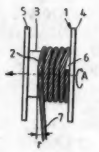
Bruno E. Buluschek, Ecublens, Switzerland, assignor to Maillefer S.A., Ecublens, Switzerland

Filed Jun. 12, 1984, Ser. No. 619,916

Claims priority, application Switzerland, Jun. 24, 1983, 3466/83

Int. Cl.⁴ B65H *54/28*

U.S. Cl. 242—158 R **11 Claims**



1. An apparatus for automatically controlling a traversing operation which controls the formation of a winding of successive turns and layers on the core of a drum, said turns and layers being formed by a cable coming from a production or treatment line, the eable being attached to the drum, the drum being rotatably driven about its axis on a support, and the cable passing through a cable-guide which is movable relative to the drum support in a direction parallel to the axis of rotation of the drum for guiding the cable at an approach angle, said apparatus comprising:

projection means for forming an image of the silhouette of a predetermined zone of said winding;

a receiving surface for receiving the projection of said silhouette;

sensing means sensitive to said image for generating electrical pulses representing said silhouette;

means for analyzing and processing said pulses and supplying control signals; and

drive means responsive to said control signals for causing relative movement between said cable-guide and said drum support, said relative movement being automatically controlled according to a predetermined function of the results of the analysis so that the approach angle is held at a constant value upon sensing of a normal image by said sensing means but undergoes a transient variation upon sensing of an abnormal image by said sensing means.

4,570,876

TAPE END DETECTING DEVICE

Toshihiro Andoh, Higashiosaka; Tatsuya Kondo, Kyoto, and Akira Toguchi, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 7, 1985, Ser. No. 709,258

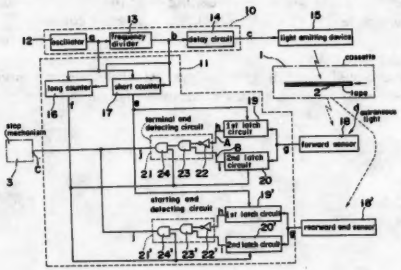
Claims priority, application Japan, Mar. 9, 1984, 59-34291[U]

Int. Cl.⁴ B65H *63/00*

U.S. Cl. 242—188 **3 Claims**

1. A device for use in a tape driving apparatus for detecting the tape end made of transparent material, comprising a cassette accommodating therein the tape to be transported by the tape driving apparatus, a control signal generating means for generating in succession signals consisting of a first output and a second output having a delay time behind said first output, a light emitting device for emitting light upon the existence of said second output from said control signal generating means, a sensor for receiving the light emitting from the light emitting

device through said tape end of transparent material, and a discriminating means for controlling the output supplied from



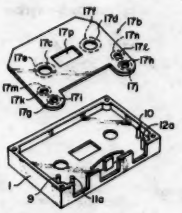
said sensor during the existence of said second output by means of said first output from said control signal generating means.

4,570,877

MAGNETIC TAPE CASSETTE

Kengo Oishi, and Masayoshi Moriwaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1984, Ser. No. 645,960
Claims priority, application Japan, Sep. 7, 1983, 58-138613[U]
Int. Cl.[4] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—199 **2 Claims**



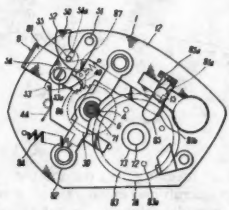
1. A magnetic tape cassette comprising a pair of tape wind-up cores, a tape which is wound up on said cores, a cassette casing having lower and upper halves which retains said tape and said cores therein, at least one pair of rotatable guide rollers provided in said casing, at least one pair of fixed guide pins each provided on a tape path between one of said cores and one of said guide rollers, and a pair of friction sheets loosely disposed between the top of said cores and the inner wall of the upper half of said casing and between the bottom of said cores and the inner wall of the lower half of said casing, respectively, wherein the improvement comprises said friction sheets having such a size as to cover the posts of said guide rollers and said guide pins, and having engaging openings loosely engaged with said posts.

4,570,878

CLUTCH AND BRAKE FOR A FISHING REEL

Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 469,720, Feb. 25, 1983, abandoned.
This application Jan. 10, 1985, Ser. No. 690,403
Claims priority, application Japan, Mar. 3, 1982, 57-30866[U]; Mar. 26, 1982, 57-43318[U]
Int. Cl.[4] A01K *89/02*
U.S. Cl. 242—220 **5 Claims**



1. A fishing reel comprising:

(a) a reel body including first and second spaced side frames;

(b) a spool having a spool shaft rotatably supported to said side frames at said reel body;

(c) a driving mechanism supported to said first side frame for driving said spool shaft;

(d) a clutch mechanism for coupling said spool shaft to said driving mechanism for driving rotation thereof and for uncoupling said spool shaft from said driving mechanism to permit its free rotation;

(e) a clutch control mechanism, including a clutch operating lever having an operating portion projecting beyond an outer radial extremity of said first side frame such that said operating portion is operable from outside said outer radial extremity to control said clutch mechanism, said clutch lever being reciprocable transversely relative to said spool shaft;

(f) a rotary member connected to rotate with said spool;

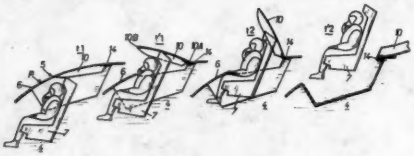
(g) a contact member for contacting with and departing from said rotary member, said contact member contacting with said rotary member to apply a resistance to rotation of said spool shaft; and

(h) an operation mechanism supported to said first side frame and operating said contact member between a contacting position and a departing position with respect to said rotary member, said operation mechanism comprising an operation lever pivoted to said first side frame at a first pivot axis, at least one swinging member which is pivoted to said first side frame at a second pivot axis and which swings in response to movement of said operation lever to control the positioning of said contact member, and an association mechanism provided between said clutch lever and one of said operation lever and said swinging member, said association mechanism engaging with said clutch lever for moving said clutch lever to set said clutch mechanism in a condition of uncoupling said spool shaft from said driving mechanism when said swinging member sets said contact member to contact with said rotary member, said association mechanism being supported to one of said operation lever and said swinging member, said clutch lever being operable independently of said operation lever to disengage said clutch mechanism such that said clutch mechanism can be operated without causing movement of said operation lever and said operation lever can be operated (i) to cause said clutch lever to disengage said clutch mechanism and (ii) substantially simultaneously to position said contact member to contact said rotary member.

4,570,879
PYROTECHNICAL PROCESS AND DEVICE FOR BAILING OUT OF AN AIRCRAFT

Gérard Dupin, Clamart, France, assignor to Avions Marcel Dassault-Breguet, Vaucresson, France

Filed Mar. 7, 1984, Ser. No. 587,069
Claims priority, application France, Mar. 14, 1983, 83 04126
Int. Cl.[4] B64C *1/32;* B64D *25/10*
U.S. Cl. 244—122 AF 6 Claims



1. A method of breaking up a transparent canopy enclosing a cockpit of an aircraft and enabling a pilot seated in an ejection seat within said cockpit to be safely ejected from said cockpit, said canopy extending downwardly and forwardly with respect to an imaginary center line of the body of said aircraft and having a front portion which is located above the knees of a pilot sitting in said ejection seat and a top portion located above the head of said pilot, the method including the sequential steps of (1) explosively separating a unitary dome portion of said top portion of said canopy using a pyrotechnical device, and (2) explosively frangibilizing said front portion of said canopy at a time when the knees of said pilot sitting in said ejection seat, which is moving out of said cockpit, are almost in contact with said front portion.

2. A device for breaking up a transparent canopy enclosing a cockpit of an aircraft and enabling a pilot seated in an ejection seat with said cockpit to be safely ejected from said cockpit, said canopy extending downwardly and forwardly with respect to an imaginary center line of the body of said aircraft and having a front portion which is located above the knees of a pilot sitting in said ejection seat and a top portion located above the head of said pilot, the device including a first pyrotechnical means which extends around a part of said top portion to enclose a dome portion which has a generally elongated trapezoidal shape defining a narrow leading edge above the head of a pilot sitting in said ejection seat and a wide trailing edge, said first pyrotechnical means being capable of separating said dome portion as a unitary element from said top portion; a separate second pyrotechnical means which extends around the periphery of said canopy where it meets the body of said aircraft, said second pyrotechnical means being capable of frangibilizing said canopy; and a sequencer means connected to both said first and second pyrotechnical means for igniting said first pyrotechnical means and thereafter said second pyrotechnical means.

4,570,880
ARRANGEMENT OF DEVICES TO SEVER AND REMOVE CANOPY WALL SECTIONS FROM AIRCRAFT COCKPITS

Hartmut Gehse, Markdorf, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,790
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213380
Int. Cl.[4] B64C *1/32*
U.S. Cl. 244—122 AF 3 Claims

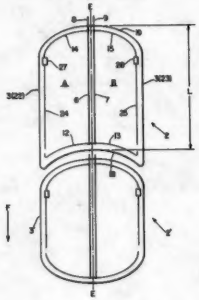
1. In an arrangement of devices for severing and removing of a canopy of a cockpit to evacuate crew members in emergencies, especially the canopy glass of aircraft, the improvement comprising

at least one fuse segments extending over at least nearly the entire length (L) of the canopy glass in the area of and along the longitudinal plane of symmetry (E—E) thereof substantially from a forward edge to a rear edge of the canopy, for severing the canopy along a central apex portion;

additional fuse segments extending over the entire or nearly entire length of the forward and rear glass edges:

means for concurrently igniting said afore mentioned fuse segments; and

longitudinal cockpit glass edges establish bending pivot supports for glass halves in the areas of clamping, the glass



halves being defined by rupture lines along said fuse segments;

means for maintaining connection of the longitudinal glass edges until rupture takes place in the clamping area with a delay with respect to the ignition of the said fuse segments;

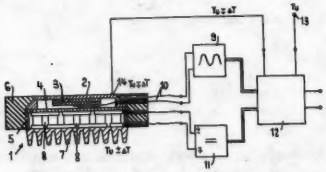
means mounting further fuse segments along the longitudinal glass edges on both sides of the plane of symmetry: and

ignition delay devices connecting these further fuse segments to an ignition system common to all fuses.

4,570,881
PROCESS FOR DETECTING THE LIKELIHOOD OF ICE FORMATION, ICE WARNING SYSTEM FOR CARRYING OUT THE PROCESS AND UTILIZATION THEREOF

Martin Lustenberger, Fribourg, Switzerland, assignor to Vibro-Meter SA, Fribourg, Switzerland

Filed May 7, 1984, Ser. No. 607,526
Claims priority, application Switzerland, Feb. 27, 1984, 940/84
Int. Cl.[4] B64D *15/20*
U.S. Cl. 244—134 F 21 Claims



1. A process for detecting a likelihood of natural ice formation on the surface of a vehicle comprising the steps of:

positioning a diaphragm having a resonant frequency of vibration on a surface of the vehicle which is exposed to natural ice formation;

exciting said diaphragm at its resonant frequency of vibration;

alternately cooling and heating said diaphragm to temperatures respectively below and above the ambient temperature in accordance with a predetermined, repetitious cycle to artificially create and then melt an accretion of ice

when the ambient temperature is near or below the freezing point;

measuring any variation in the resonant frequency of vibration of the diaphragm during said step of alternately and repetitiously cooling and heating the diaphragm;

signaling an alarm whenever said variation exceeds a predetermined value.

16. The ice warning system of claim 12 wherein said microprocessor is operable to energize a de-icing system whenever the variation in the resonant frequency of the diaphragm exceeds said predetermined value.

4,570,882

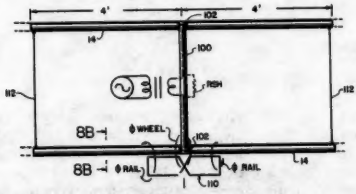
VITAL TRACK CIRCUIT WHEEL DETECTOR

Klaus H. Frielinghaus, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 17, 1983, Ser. No. 458,234

Int. Cl.[4] B61L *21/00, 3/34*

U.S. Cl. 246—34 R **14 Claims**



1. A vital, or fail-safe, track circuit wheel detector system for detecting the presence and position of wheel-axles on railroad cars, comprising:

a pair of rails;

a pair of boundary shunt means spaced independently of minimal wheel spacing;

a path for current flow, said path including said rails and said pair of boundary shunt means so as to define a detection zone;

a transmitter or source having a high frequency output;

means for coupling said transmitter to said path;

sensing means, including a pick-up coil, for providing a steady, bias output signal, derived from said path for current flow, responsive to the absence of wheel-axles in said detection zone;

said pick-up coil being oriented outside of the rails and adjacent to the center line of said detection zone, for sensing field changes due to particular directional components of wheel-axle shunt current flow when a wheel-axle is in close proximity to said pick-up coil;

said directional components being such as to oppose said steady, bias output signal, thereby providing a net reduced signal at the output of said pick-up coil to indicate the presence of said wheel-axle.

4,570,883

TUBE SUPPORT GRID

Robert M. Wepfer, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,060

Int. Cl.[4] G21C *3/30*

U.S. Cl. 248—49 **10 Claims**

1. A tube support grid for supporting a plurality of closely packed tubes, said tube support grid comprising:

a first set of generally parallel flat bars with a pair of generally parallel longitudinal margins;

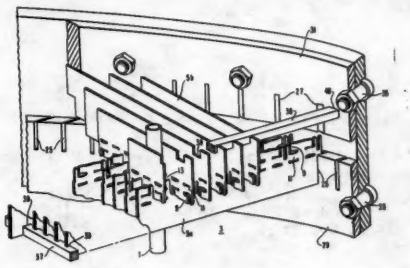
a second set of generally parallel flat bars with a pair of generally parallel longitudinal margins disposed at an angle with respect to the first set of flat bars;

said bars having resilient offset portions which are disposed adjacent one of said margins to permit contact with the tubes and stiff offset portions which are disposed inboard of said margins to permit contact with the tubes;

said offset portions being so disposed that the stiff and resilient offset portions are generally disposed on opposite sides of the tubes;

said flat bars being punched adjacent said offset portions forming holes in the flat bars adjacent said offset portions;

said resilient offset portions and said punched holes cooperating to form "T" shaped portions with short stems and cross portions having ends offset in opposite directions and generally parallel with respect to the flat bars;



each set of flat bars also having slots which receive the other set of bars;

at least one slotted ring having slots disposed to receive the ends of said flat bars; and

means for capturing said ends of said flat bars in said ring to form the tube support grid.

4,570,884

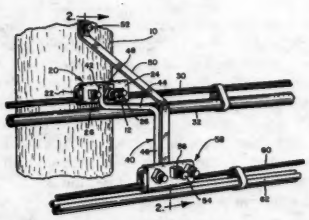
COMMUNICATION CABLE SUPPORT SYSTEM

George E. Armbruster, Park Ridge, Ill., assignor to Illinois Bell Telephone Company, Chicago, Ill.

Filed Nov. 22, 1983, Ser. No. 554,182

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—68.1 **3 Claims**



1. In combination with a cable support pole of the type comprising a fastener extending through the pole, a first strand clamp mounted by the fastener to the pole, and a first communication cable supporting strand secured by the first strand clamp, the improvement comprising:

a one-piece, integral support bar comprising a central horizontal leg, an inner vertical leg secured at one end of the horizontal leg, and an outer vertical leg secured at the other end of the horizontal leg, said inner vertical leg defining a first horizontally oriented opening sized to receive the fastener such that the inner vertical leg is secured to the pole by the fastener and the horizontal leg extends substantially no higher than the first strand clamp, said outer vertical leg defining a second horizontally oriented opening;

a second strand clamp comprising a fastener passing through the second horizontally oriented opening to secure the

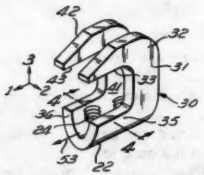
second strand clamp to the outer vertical leg at a point laterally spaced from and below the first strand clamp, said second strand clamp adapted to secure a second communication cable supporting strand in place laterally spaced from and below the first communication cable supporting strand.

4,570,885

HANGER CLAMP BODY AND METHOD OF FORMING SAME

Richard W. Heath, La Habra, Calif., assignor to Tolco, Incorporated, Brea, Calif.

Filed Sep. 19, 1983, Ser. No. 533,215
Int. Cl.[4] F16L *3/24*; B23P *13/00*; B21D *9/04*
U.S. Cl. 248—72 2 Claims



1. A method of forming a pipe hanger clamp body comprising:

blanking a metal plate into generally an E-shape, having a main body portion, a middle tine and a pair of end tines, said blanking step including cutting the middle tine to form straight edges each parallel to and facing a straight edge on a respective one of said end tines, said blanking step further including cutting said tines so that the dimension of said middle tine perpendicular to said edges is considerably greater than the dimension of said end tines perpendicular to said edges, said blanking step further including cutting the tines so that the length of each of said end tines is greater than the length of said middle tine, and said blanking step further including cutting the outer edges of said end tines, remote from said middle tine, so that said outer edges taper towards the tips of said outer tines so that the outer tines are wedge-shaped;

bending the plate about the middle tine of the E-shape to form a generally U-shaped clamp with a portion of the middle tine forming the bight or end wall of the U-shape and with the remainder of the E-shape forming the legs of the U-shape, each leg forming a generally C-shaped side member joined by the end wall with the portions of the middle tine forming lower support arms of the C-shaped members and with the end tines forming the upper arms of the C-shaped members;

forming a threaded hole through the portion of the end wall formed by said middle tine to receive a set screw extending towards said upper arms so that an overhead support may be clamped between the set screw and said upper arms; and

forming a threaded hole in said end wall for receiving a pipe hanger rod, the axis of the rod hole being approximately aligned with the portions of said C-shapes that were formed by the main body portion of the E-shape.

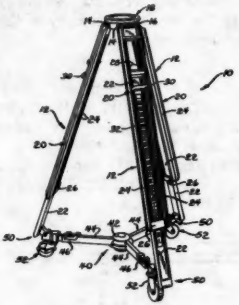
2. A pipe hanger clamp body prepared by the method of claim 1.

4,570,886

LOCKING MECHANISM FOR TRIPOD AND SPREADER LEGS

Paul C. Mooney, c/o Quick Set, Inc., 3650 Woodhead Dr., Northbrook, Ill. 60062

Filed Nov. 18, 1982, Ser. No. 442,855
Int. Cl.[4] F16M *11/08*
U.S. Cl. 248—186 4 Claims



1. In an apparatus including a tripod having three legs and a spreader having three legs, said spreader legs and tripod legs being easily connectable to and disconnectable from one another by an operator to secure the tripod in or release it from a desired configuration, quick release interlocking mechanisms for securing each of said tripod legs to a respective spreader leg, each interlocking mechanism comprising:

a pin fixed to said tripod leg;

a V-slot in said spreader leg for receiving said pin;

a clevis on said tripod leg, said clevis having flanges between which said pin extends, said flanges being adapted to engage opposite sides of said spreader leg when the pin is received in the V-slot;

a latch plate pivotable with respect to said spreader leg, said plate including a locking flange for retaining said pin in said slot and releasing flange engagable by an operator's foot to pivot said plate away from its retaining position; and

means for biasing said plate toward its pin retaining position.

4,570,887

QUICK-CONNECT MOUNT FOR A CAMERA AND TRIPOD

Gerald K. Banister, 11738 Crazy Horse Trail, Conifer, Colo. 80433

Filed Oct. 17, 1983, Ser. No. 542,673
Int. Cl.[4] F16M *11/04*
U.S. Cl. 248—187 7 Claims

1. A quick-connect mount for attachment of a camera to a tripod, said mount comprising:

(a) a receiving member having a longitudinally extending slot with a first shape, the shape of said slot being defined by first immovable wall portions;

(b) first means for attaching said receiving member to said tripod, said first attaching means preventing translational and rotational displacement between said tripod and said receiving member;

(c) a connector plate having a second shape which mates with the slot of said first shape by sliding engagement, said second shape being defined by second immovable wall portions, engagement between said connector plate and said receiving member preventing relative translation between said plate and said member along two of the three dimensional axes and relative rotation about all three axes;

(d) second means for attaching said connector plate to said camera, said second attaching means preventing transla-

tional and rotational displacement between said camera and said connector plate; and

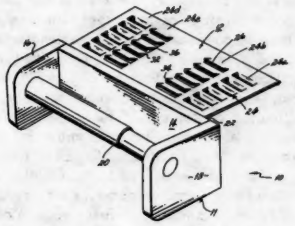
(e) means for securing said connector plate to said receiving member to prevent translation along the third dimensional axis, thereby securing said camera to said tripod.

4,570,888

FASTENER FOR HOLDING AN OBJECT TO THE SIDE OF A DRYER

Warren E. Evans, R.R. #1, Box 74, Lawrenceburg, Ind. 47025

Filed Sep. 29, 1983, Ser. No. 537,101
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—205.1 **5 Claims**



1. A bracket for attaching an article to the side of an object through an elongated opening in said object comprising

a thin elongated plate adapted to slide within said elongated opening

first means to attach said plate to said article

said plate including a plurality of barbs, said barbs spaced along said plate at a plurality of different distances from said first means, said barbs having a first edge attached to said plate and a second edge extending away from said plate,

said barbs being flexible and resilient;

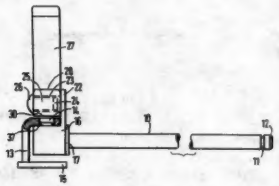
whereby said plate is attached to said object by inserting said plate into said opening, causing said barbs to contract and subsequently expand as they pass through said opening.

4,570,889

BEARING BRACKET FOR MOUNTING A BEARING SHAFT TO A MOUNTING STRIP

Franco Berg, Isernhagen, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Herborn, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,625
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 8332758[U]
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—220.2 **20 Claims**



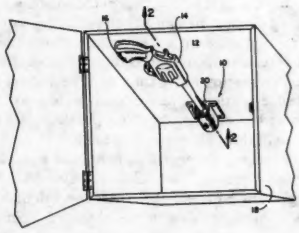
1. A bearing bracket for fastening a shaft (10) to a mounting strip (13) of a control panel (15) having a row of holes (14), said bearing bracket comprising a bearing block (16) having bore (18) for receipt of one end of said shaft (10), a seating area (37) parallel to said bore (18) and having centering pins (20) extending therefrom arranged for insertion into said holes (14) of said mounting strip (13), a flange (22) extending perpendicularly from said seating area (37), and a pivot means (23) extending perpendicularly from said flange (22) spaced from said seating area (37), a locking lever (27) pivotally attached to said pivot means and including a tensioning eccentric (28) thereon which forces said mounting strip (13) against said seating area (37) of said bearing bracket (16).

4,570,890

UNIVERSAL HOLDER FOR MOUNTING HANDGUNS REMOTE FROM THE USER

Edwin E. Lohn, 9 Middleridge Lane South, Rolling Hills, Calif. 90274

Filed Apr. 26, 1984, Ser. No. 604,247
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—274 **10 Claims**



1. A handgun holder in combination with a handgun having a gunsight and a hand grip for use in conjunction with an apparatus having a surface adjacent which said handgun is to be positioned out of sight for easy retrieval, said combination comprising:

(A) rod means receiving a barrel of said handgun by extending into said barrel to support the weight of said handgun while allowing a user to quickly and easily remove said handgun therefrom by grasping the grip and withdrawing the gun barrel from the rod;

(B) support means rigidly holding said rod means in a position spaced from said surface by an amount to receive the

barrel of said handgun between said surface and said rod in a non-interfering manner;

(C) pin means extending outwardly from said support means adjacent said rod means engaging the gun sight on said handgun in a non-fixed relationship to hold the grip of said handgun at a predetermined angle other than 90 degrees with respect to said surface the engagement between the gun sight and the pin means being the only means for retaining said grip at said predetermined angle; and

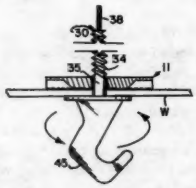
(D) means for fixedly securing said support means to said surface.

4,570,891

FLIP TOGGLE ANCHORING DEVICE

Stanley Kaplan, c/o Universal Fastenings, 45 Gilpin Ave., Hauppauge, N.Y. 11788

Filed Apr. 24, 1983, Ser. No. 488,146
Int. Cl.[4] F16B *13/04*; B42F *13/00*
U.S. Cl. 248—341 5 Claims



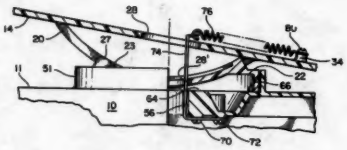
1. An anchoring device for securing a member to a wall surface, said device comprising; a channel shaped toggle plate dimensioned to fit into an opening in the wall to which it is desired to secure the member, said toggle plate having a threaded opening therethrough; a thickened boss around said toggle plate opening; serrations on the surface of said toggle plate arranged to engage the wall surface to which the member is to be secured; an elongate rod-like engaging element coupleable to the member to be secured to the wall, said engaging element dimensioned to extend through the wall opening into and through the toggle plate adjacent the toggle plate opening, said engaging element having a flattened cross-section flexible threaded portion adjacent a free end of said element engageable in the threaded opening in said toggle plate, the flexibility of said flexible portion being such as to permit ready bending of said flexible portion of said engaging element into a plane parallel to and in sufficiently close proximity to said toggle plate so as to fit through the wall opening with the toggle plate when said engaging element is so bent, said engaging element also having a threaded relatively rigid circular cross-section threaded portion adjacent the flexible portion, which rigid portion is also engageable in the threaded opening in said toggle plate; and said engaging element further including an unthreaded section on said engaging element adjacent said rigid portion and adjacent the end opposite the free end of the engaging element, said unthreaded section of a length equal to the thickness of the wall to which the member is to be secured plus the thickness of said boss; and a hook secured to the end opposite the free end of said engaging element, whereby, after said toggle plate is passed through the wall surface, said engaging element is rotated by said hook until said relatively rigid circular cross-section threaded portion of said engaging element passes through said threaded opening in said boss so that said unthreaded section is located in said threaded opening permitting said hook to swivel when mounted.

4,570,892

TILTABLE ROTATING DISPLAY MONITOR MOUNT

John F. Czech, Mt. Prospect; Irving M. Drucker, Des Plaines, and Akinobu Inaba, Prospect Heights, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 11, 1984, Ser. No. 680,612
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—372.1 5 Claims



1. A tiltable rotating assembly for a display monitor having a convex lower portion with a first aperture therein for stably positioning said display monitor over a continuum of tilt and rotational orientation angles, said assembly comprising:

a base having a generally flat, circular upper recessed portion including a pair of facing arcuate slots therein and a second aperture positioned therebetween and generally in the center of said upper recessed portion;

a generally circular housing adapted for insertion within the upper recessed portion of said base and including first coupling means positioned within said arcuate slots for coupling said housing to said base and for permitting rotational displacement therebetween, said housing further including an upper concave portion adapted to receive the convex lower portion of the display monitor and having a pair of elongated, spaced slots and a third aperture positioned therebetween and generally in the center of the upper concave portion of said circular housing, wherein said first, second and third apertures are aligned with one another;

second coupling means including first and second connecting members mounted in spaced relation to the convex lower portion of the display monitor and inserted through a respective elongated slot in the upper concave portion of said housing in combination with a respective combination of a coil spring and a bushing positioned in contact with said housing for coupling said display monitor to said housing and for permitting the displacement of the display monitor over a continuum of tilt angles, wherein the engagement between said display monitor and said housing may be varied by adjusting the force exerted upon said bushing by said coil spring and wherein the center of gravity of said display monitor exerts a rotational moment urging said display monitor in a first direction of rotation within said housing;

first and second pairs of complementary, mutually engaging guide rails respectively positioned on the convex lower portion of the display monitor and on the upper concave portion of said housing, wherein each of said second pair of guide rails is parallel to and closely spaced from a respective elongated slot in the upper concave portion of said housing; and

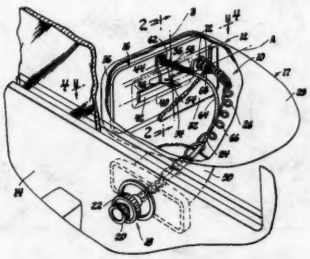
biasing means positioned within said aligned first, second and third apertures and coupling said display monitor and said base for urging said display monitor in a second, opposite direction of rotation within said housing in counterbalancing the rotational moment of said display monitor's center of gravity in providing for the stable positioning of said display monitor over a continuum of tilt angles.

4,570,893

DUAL CONTROL MECHANISM FOR A REMOTELY LOCATED MIRROR

David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1984, Ser. No. 605,059
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—487 6 Claims



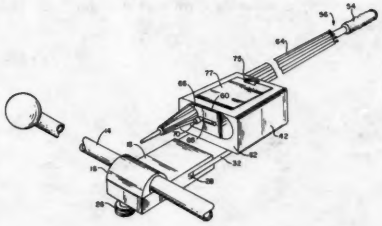
1. A mechanism for positioning an element about a pair of intersecting pivot axes, said mechanism comprising a mounting bracket member, means universally pivoting said element on said mounting bracket, a pair of flexible helical spring screw drives connected at one end to said element at spaced points thereof, remotely located first and second knob means, the other end of one of said pair of screw drives being connected to a flexible shaft member and the other end of the other of said pair of screw drives having a plurality of helix sections, said helix sections being wound about said shaft member so that a portion of one screw drive is within the other and said helix sections and said shaft member being connected to said first and second knob means so that rotation of one of said knob means causes movement of the element about one of said pair of pivot axes and rotation of said other of said knob means causes movement of the element about the other of said pair of pivot axes while one or more helix sections of said other of said helical spring screw drives unwinds from or winds about said shaft member.

4,570,894

UMBRELLA HOLDER FOR GOLF CART

Angelo M. Miele, 72 W. Main St., Rahway, N.J. 07065

Filed Aug. 6, 1984, Ser. No. 637,906
Int. Cl.[4] A47G *25/12*
U.S. Cl. 248—534 7 Claims



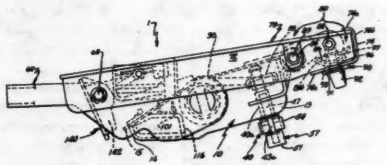
1. In combination, an umbrella, said umbrella including a shaft, a handle located at one end of said shaft and a canopy portion located at an opposite end of said shaft and movable between an open position, in which said canopy portion extends generally radially outward from said shaft, and a closed position, in which said canopy portion is collapsed against said shaft; and an umbrella holder, said umbrella holder including attaching means for releasably and adjustably attaching said holder to a handle of a golf cart such that said holder is adjustable between a first position, in which said umbrella is maintained in a substantially vertical orientation when said canopy portion of said umbrella is in its open position, and a second position, in which said umbrella is maintained in a substantially horizontal orientation transversely of the handle of the golf cart when said canopy portion of said umbrella is in its closed position, and holding means for removably holding said handle of said umbrella when said canopy portion is in its open position and for removably holding said canopy portion of said umbrella when said canopy portion is in its closed position, said holding means having a bore extending therethrough defining a first open end located on one face of said holder and a second open end located on an opposite face of said holder, a stop for lateral movement with respect to said bore and located has been included following the term "mounted"; mounted on said one face of said holder, said stop being movable between an extended position, in which said first open end of said holding means is obstructed by said stop so as to engage said handle of said umbrella when said canopy portion of said umbrella is in its open position and said handle of said umbrella is inserted into said bore from said second open end, and a retracted position, in which said first open end of said holding means is not obstructed by said stop so as to permit said canopy portion of said umbrella to extend beyond said one face of said holder when said canopy portion is in its closed position and is inserted through said bore said umbrella holder including storing means for storing golf balls, said storing means including another bore which extends through said umbrella holder from said one face thereof to said opposite face thereof, said stop being movable to positions for obstructing and not obstructing said another bore to control the dispensing of golf balls from said storing means.

4,570,895

CHAIR CONTROL TENSION ADJUSTMENT ASSEMBLY

Ronald L. Whitwam, Caledonia, and Charles C. Pergler, Grand Rapids, both of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 145,440, May 1, 1980. This application Jun. 3, 1982, Ser. No. 384,647
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—575 21 Claims



1. A chair control having a stationary member, a tiltable member pivotally connected thereto, bias means operably connected to both to control the rate of tilt and to return the tiltable member to its normal position, a threaded member operably connected to the bias means and a bolt threaded in the threaded member whereby tightening or loosening said bolt changes the pretension on the bias means, the improvement in said chair control comprising: said bolt having a hollow shank with an open end, a lever being telescopically received in said hollow shank and projecting from said open end, means on said bolt engagable by said lever when said lever is retracted from said hollow shank and pivoted to a generally lateral position with respect to said bolt; means preventing said lever from being completely removed and separated from said bolt when it is retracted from said hollow shank; retainer means on said bolt normally holding said lever in a stored position within said hollow shank, said retainer means being adapted to yield upon application of manual force to allow said lever to be withdrawn from said hollow shank and pivoted to its lateral posi-

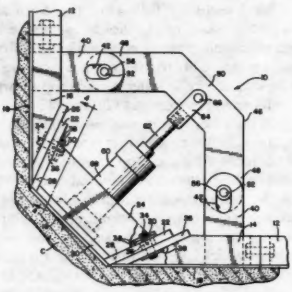
tion engaging said engagable means on said bolt, said retainer means comprising a retainer cap seated on the end of said hollow shank and including an aperture therein through which said lever passes.

4,570,896

SLIDE ACTION INSIDE CORNER FORM

James K. Strickland, and H. Grady Ivey, both of Jacksonville, Fla., assignors to Strickland Systems, Inc., Jacksonville, Fla.

Filed Feb. 6, 1984, Ser. No. 577,356
Int. Cl.[4] B28B 7/30
U.S. Cl. 249—27 6 Claims



1. A concrete form unit for casting an inside corner comprising:

a pair of form panels providing external casting faces disposed generally perpendicular to each other, said panels defining spaced adjoining edges therebetween which edges provide opposed guide surfaces;

an elongated corner member disposed between said adjoining edges of said form panels, said member providing an external casting face bridging the space between said adjoining edges and having opposite side surfaces defining a tapered wedge on said corner member, said wedge having an acute angle included between said opposite side surfaces with the taper of said wedge converging toward said external casting face of said corner member, said side surfaces being slidingly interengaged with said guide surfaces on said form panels;

means coupling said side surfaces of said tapered wedge to said guide surfaces to maintain sliding interengagement between said surfaces during relative movement between said corner member and said form panels, said coupling means including a pin and slot coupling between each pair of interengaged surfaces;

yolk means having a pair of end sections with each end section being guidingly connected to one of said form panels by a pin and slot connection between each yolk means end section and one of said form panels;

a bracket extending inwardly of the form panel casting face carried by each of the said form panels, said pin and slot connection being formed by one of said bracket and said end section being provided with an elongated slot and the other of said bracket and said end section carrying pin means received in said elongated slot; and

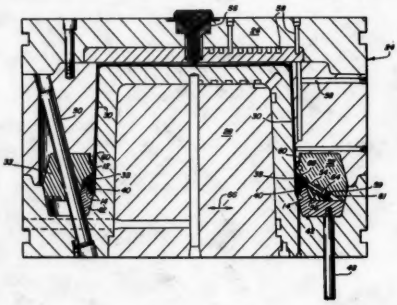
actuator means having relatively movable parts including a first part connected to the midsection of said yolk means and a second part connected to said corner member whereby relative movement between said parts causes said corner member and said form panels to shift said concrete form unit from a casting condition whereat said casting faces are contiguous with one another to a collapsed condition.

4,570,897

MOLD FOR CONTAINER WITH RECESS-DEFINING FLANGE

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Filed Jan. 23, 1985, Ser. No. 694,153
Int. Cl.[4] B29C 1/06, 1/16; B29F 1/00
U.S. Cl. 249—144 17 Claims



1. In a container mold comprising a mold cavity portion and a mold core portion, said mold cavity and mold core portions being relatively movable between a closed, molding position and an open position for removing the freshly molded container, the improvement comprising, in combination:

means for molding a recess-defining flange in said container, said means including;

a split support and mold member comprising a plurality of segments and positioned adjacent the site of said recess-defining flange molded therein; an inner mold member positioned in a first position to participate in molding the recess of said recess-defining flange, and capable of being spaced from said flange in a second position, said inner mold member comprising separate portions each carried by said segments, said inner mold member portions being each capable of inward and outward movement relative to said segments;

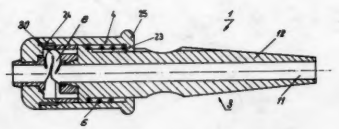
and means for moving said segments longitudinally and outwardly as said mold moves from the molding to the open position, whereby said inner mold member is withdrawn from the recess of said flange.

4,570,898

CATHETER VALVE

Hugo Staeubli, Einsiedlerstrasse 240, 8810 Horgen, Switzerland

Filed Mar. 14, 1983, Ser. No. 475,291
Claims priority, application Switzerland, Mar. 12, 1982, 1593/82
Int. Cl.[4] F16L 55/14
U.S. Cl. 251—4 22 Claims



1. A normally closed catheter valve operable to be opened by actuation thereof, comprising a relatively fixed part with a through-flow bore, a rubber elastic valve hose means on the inside of the valve and adjoining the relatively fixed part substantially in extension of said bore, said valve hose means being closed in the non-actuated normal position of the valve by deformation of the hose means and being continuously open

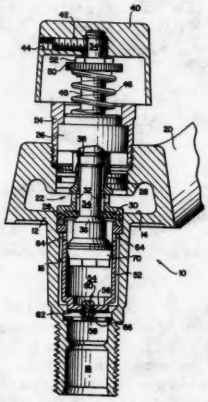
while the valve is actuated, a spring-loaded element, a spring operatively connected with said spring-loaded element, said spring-loaded element being operatively associated with said valve hose means and being movable relative to the relatively fixed part and operable by its movement in a direction opposite the spring force to open the closed hose means.

4,570,899

ADJUSTABLE SLOW CLOSING VALVE ASSEMBLY

Paul E. Kingham, Milford Center, Ohio, assignor to Household Manufacturing, Inc., Prospect Heights, Ill.

Filed Nov. 19, 1984, Ser. No. 672,830
Int. Cl.[4] F16K 47/04
U.S. Cl. 251—51 7 Claims



1. A slow closing valve comprising:

a valve body having a cavity with inlet and outlet ports communicating with said cavity and a valve seat defined within said cavity intermediate said ports;

a valve stem reciprocably mounted on said body within said cavity carrying an operating handle disposed exteriorly of said valve body and a valve member to cooperate with said seat;

wall means defining a dash-pot chamber with one end of said chamber being in communication with both said inlet port and said valve seat;

a plunger sealingly reciprocable within said chamber between the chamber ends, said plunger being connected to reciprocate with said valve stem;

resilient flow control valve means mounted on said wall means and placing the other end of said chamber in communication with said inlet port, said flow control valve means including a control valve member consisting of a body of resilient material having a stem element and an enlarged circular portion integral with one end of said element, said stem element serving to freely mount said member by extending through an aperture formed in the area of said wall means mounting said member on an interior surface of said wall means whereby said member is constructed to allow restricted flow of fluid into said other end of said chamber upon plunger movement in one direction and relatively free egress of fluid flow from said chamber upon reverse plunger movement, said wall means area having its exterior surface formed to cooperate with and engage said enlarged circular portion to control the rate of said restricted flow of fluid and said enlarged portion being disengaged from said exterior surface upon reverse plunger movement; and

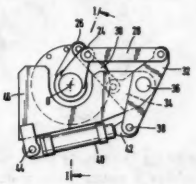
biasing means urging said plunger in said one direction.

4,570,900

APPARATUS FOR ACTUATING A PROPORTIONING VALVE

Emile Lonardi, Bascharage, and Victor Kremer, Luxembourg, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Jun. 28, 1984, Ser. No. 625,607
Claims priority, application Luxembourg, Jun. 29, 1983, 84890
Int. Cl.[4] F16K 31/122
U.S. Cl. 251—58 7 Claims



1. An apparatus for actuating a proportioning valve, the valve consisting of a pair of registers, each register having a cut-out portion defining a variable area orifice which is generally symmetrical about a central longitudinal axis through the orifice, the registers being respectively connected to a first and second drive shaft, the drive shaft being mounted coaxially with respect to each other about a common axis including:

first and second arm means, said first arm means being connected to said first drive shaft at a first end thereof and said second arm means being connected to said second drive shaft at a first end thereof;

first and second connecting rod means being pivotably and respectively connected at first ends thereof to second ends of said first and second arm means;

first and second tilting lever means, each tilting lever means being pivotally connected to a second end of said connecting rod means, said lever means being mounted on pivot shaft means, said pivot shaft means being parallel to said common axis of said drive shaft;

said pivotable connection between said first tilting lever means and said first connecting rod means and said pivotable connection between said second tilting lever means and said second connecting rod means being on opposite sides of the plane defined by said common axis and said pivot shaft means; and

driving means, said driving means urging said first and second tilting lever means to pivot about said pivot shaft means wherein said registers are simultaneously actuated in opposite directions.

4,570,901

POSITIONING ASSEMBLY FOR USE WITH ROTATABLE VALVES

Edward G. Holtgraver, Spring, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Dec. 28, 1984, Ser. No. 687,293
Int. Cl.[4] F16K 31/60, 35/00
U.S. Cl. 251—98 14 Claims

1. An assembly for use with a rotatable valve having a body, a rotatable valve element and a stem interconnected to said rotatable valve element comprising:

positioning means carried by said valve body; and

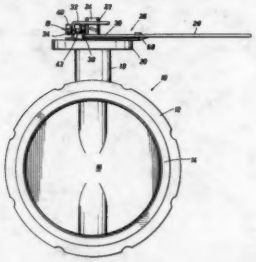
handle means, said handle means including

a stem engagement portion attached to said stem, said engagement portion having means for preventing substantive relative rotational movement between said engagement portion and said stem;

a handle portion attached to said stem engagement portion and extending generally transverse to said stem, said handle portion being resiliently flexible along its length

in a plane passing generally axially through said stem; and

latch means carried by said handle portion, said latch



means being selectively engageable and disengageable with said positioning means solely in response to movement of said handle portion due to the flexure of said handle portion.

4,570,902

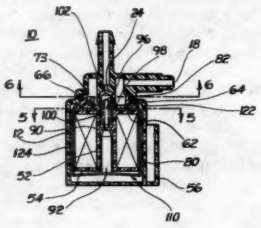
EVAPORATION CANISTER FLOW RATE VALVE

Kwang Yew, and Ron Mitchell, both of Chatham, Canada, assignors to Allied Corporation, Morris Township, N.J.

Filed Sep. 21, 1984, Ser. No. 653,647

Int. Cl.[4] F16K *31/06*

U.S. Cl. 251—129.15 **19 Claims**



1. A valve comprising a housing which includes a first or inlet port in selective communication with a second or outlet port, the housing defining a valve seat in communication with the first input port and valve guide means circumferentially positioned about said valve seat, said housing further includes a coil assembly cavity for receiving a coil assembly; said coil assembly comprising a bobbin including an axially extending column and a coil circumferentially wound about said column, said column including a partially extending lower bore and a partially extending upper bore axially aligned with said valve means and a top member which includes means for receiving a magnetic strap means;

a metallic cylinder positioned within said lower bore and extending therefrom;

piston means reciprocatively located within said upper bore, slidably received within said valve guide means and positioned for sealing engagement with said valve seat for selectively opening and closing communication between said first port and said second port in response to control signals input to said coil;

strap means positioned within said receiving means in surrounding relation to said coil for biasing said cylinder into said lower cavity and for establishing a magnetic circuit in concert with said metallic cylinder and said piston means.

4,570,903

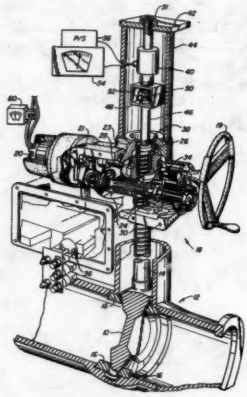
METHOD AND APPARATUS FOR MEASUREMENT OF VALVE STEM THRUST

Otto G. Crass, 1874 Seventh St., Los Osos, Calif. 93402

Filed Apr. 19, 1982, Ser. No. 369,563

Int. Cl.[4] F16K *31/05*

U.S. Cl. 251—129.12 **18 Claims**



1. An apparatus for measuring the actual thrust supplied by a valve stem to a valve body and associated valve seat, the valve body, valve seat and valve stem being disposed within a housing, wherein one end of the valve stem is accessible externally to the housing, and further wherein an actuating force is applied to the valve stem by actuating means and a transmission assembly which are positioned in a housing, the apparatus comprising

force measuring means positioned for coupling to the externally accessible end of the valve stem;

means for mounting the force measuring means to the housing of the actuator means and independently of the transmission assembly;

means for coupling the force measuring means to the externally accessible end of the valve stem to provide an instantaneous measurement of the axial force on the stem; and

means for terminating the operation of the actuating means whenever a predetermined actuator means operating state is reached.

4,570,904

SOLENOID VALVE

Charles J. Mullally, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Jul. 11, 1984, Ser. No. 629,955

Int. Cl.[4] F16K *31/02*

U.S. Cl. 251—129.21 **6 Claims**

1. A normally closed three way solenoid valve comprising

a valve housing including a transverse wall,

an extension extending axially from said transverse wall,

a peripheral wall extending axially from the periphery of the transverse wall in a direction opposite to the direction in which the axial extension extends,

a pole member including a pole piece extending axially inwardly of the housing and having a transverse wall extending radially outwardly into engagement with the peripheral wall and connected thereto,

said pole piece having an axial opening therethrough,

said pole piece defining a first conical seat,

said axial extension of said housing having an axial opening aligned with the opening of said pole,

an insert of non-magnetic material positioned in an axial

opening in said axial extension and having an axial opening,

said insert defining a second seat and having an axial opening,

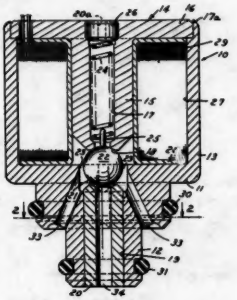
a ball interposed between the first and second seat and having limited movement between said seats,

said axial opening in said pole piece having a narrow portion adjacent the first seat,

spring means comprising a spring positioned in said axial opening in said pole piece and having a projection yieldingly urged by said spring through said narrow portion of the axial opening and said first seat to yieldingly urge said ball into engagement with the second seat,

said housing and pole member defining an annular space,

a coil assembly in said annular space,



a plurality of circumferentially spaced passages in said housing spaced from said insert extending from adjacent the periphery of the ball through the axial extension of the housing at an acute angle to the axial opening in the axial extension to the periphery of the housing,

such that when fluid is applied to the axial opening in said insert and the coil is de-energized, said spring means holds the ball against the second seat and prevents flow through said axial opening in said insert while permitting communication between the angular passages about the ball and first seat through the axial opening in the pole, and when the solenoid is energized the ball is drawn toward the first seat to close communication to the axial opening in the pole and permit flow from the axial opening in the insert past the second seat and through the circumferentially spaced passages by the insert to the exterior of the axial extension.

4,570,905

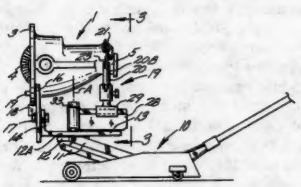
FLOOR JACK ASSEMBLY FOR REMOVING AUTO DIFFERENTIALS

Norman G. Gerstner, P.O. Box 2406, Soldotna, Ak. 99669

Filed Aug. 20, 1984, Ser. No. 642,089

Int. Cl.[4] B66F *7/26*

U.S. Cl. 254—134 **5 Claims**



1. A jack assembly for installation of an automotive floor jack for removing a vehicle drive line component which defines bolt hole openings, said jack assembly comprising,

a platform for securement to a lifting surface of the floor jack,

arm means including upright arms with each arm having a post adjacent an arm end and individually insertable through the openings in the driveline component,

means adjustably mounting said arm means on said platform,

a support assembly on said platform and including a rail, means coupling said rail to said platform and including a vertically disposed pivot member on which one end of said rail is mounted to permit horizontal positioning of said rail about said pivot member, shoe means adjustably mounted on said rail, a rest carried by said shoe means and on which a drive line component may be partially supported, hold-down means on said rest for engagement with said drive line component, and

vertically adjustable means coupling said shoe to said rest to permit vertical positioning of said rest preparatory to engagement with the drive line component.

4,570,906

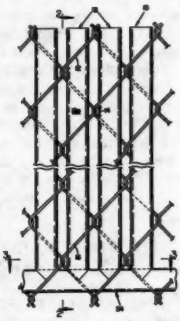
SLAT ASSEMBLY FOR CHAIN LINK FENCE

Fred O. Walden, Eatonville, Wash., assignor to Pacific Fence & Wire Co., Clackamas, Oreg.

Filed Jul. 16, 1984, Ser. No. 631,481

Int. Cl.[4] B21F *27/00;* E04H *17/02*

U.S. Cl. 256—34 **4 Claims**



1. An assembly of slat members insertable in chain link fence comprising:

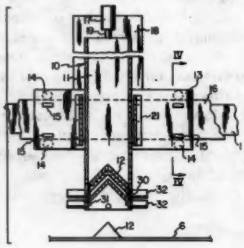
a plurality of elongate, first slat members having opposed, substantially planar faces predimensioned to be interwoven between vertically consecutive links of the fence, each first slat member having a lower end formed with bottom edges from which extend a pair of substantially planar and resilient, spaced-apart flange members which taper inwardly widthwise; and

an elongate second slat member, having opposed, substantially planar faces predimensioned to be interwoven between horizontally consecutive, lower links of the fence for presenting an upwardly facing edge so that when the first slat members are disposed toward and positioned against the second slat member at any location along its upwardly facing edge, the bottom edges of the first slat members will seat upon the upwardly facing edge of the second slat member so that the flange members overlap opposite faces of the second slat member.

4,570,907
APPARATUS FOR PLACING POINT SUPPORTS ON A METAL CUTTING TABLE

Harry E. Anderson, 307 Foxcroft Rd., Pittsburgh, Pa. 15220, and Raymond E. Heasley, 38 Silver La., McKees Rocks, Pa. 15136

Filed Dec. 10, 1984, Ser. No. 680,165
Int. Cl.[4] B23K 7/02, 7/10
U.S. Cl. 266—69 16 Claims



1. In a cutting machine for cutting metal parts from metal workpieces, a main beam forming a gantry, means mounting said main beam for movement along rails in a first direction, at least one cutting torch mounted on said main beam and movable along said main beam in a second direction substantially perpendicular to said first direction and a cutting table having a substantially planar cutting surface located below said main beam, the improvement comprising at least one dispenser unit adapted to carry a plurality of individual point support members for metal workpieces during cutting, said dispenser unit including an elongated tube having an open lower end, first means mounting said tube on said main beam for movement along said main beam in said second direction, second means mounting said tube on said first means for vertical movement relative to said cutting surface of said cutting table, said tube having means adjacent said open lower end for selectively depositing individual point support members on said cutting surface of said cutting table, whereby individual point support members may be deposited on said cutting surface of said cutting table to support workpieces at locations determined by the size and shape of metal parts to be cut from the workpieces.

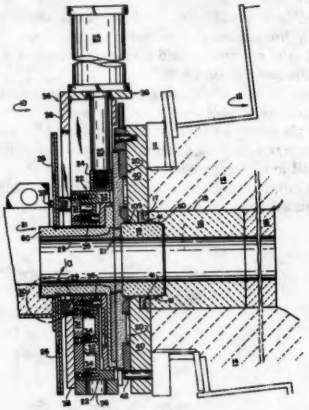
4,570,908
FURNACE VALVE

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Division of Ser. No. 478,218, Mar. 24, 1983, Pat. No. 4,474,362. This application Apr. 23, 1984, Ser. No. 602,828
Int. Cl.[4] C21C 5/42
U.S. Cl. 266—236 13 Claims

3. A sliding gate valve organization for controlling the flow of molten metal from a substantially non-rotatable vessel having a generally transversely extending pour opening through a substantially upstanding wall of said vessel constructed to pour contents in a substantially horizontal direction, said valve including a generally vertically elongated housing secured to the upstanding wall of the vessel, a stationary refractory plate in said housing and having an orifice in open communication with said vessel pour opening, a slide frame movably mounted in said housing, an orificed refractory slide plate in said housing and urged into pressure sealing, face-to-face relation with said stationary plate and drive means connected to said slide frame for reciprocating said slide frame and said slide plate within said housing to place the orifice therein into and out of registry with the orifice in said stationary plate wherein an erosion pocket is generated in the wall of the stationary plate orifice in the region thereof facing the direction of movement of the slide plate upon closure,

wherein said drive means is operatively connected to said slide frame to move said slide plate orifice in an upward direction out of registry with the stationary plate orifice to

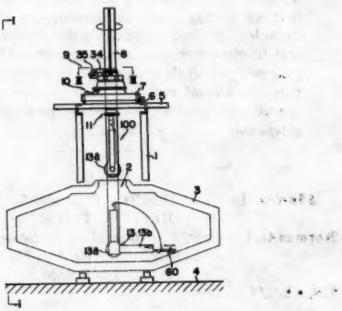


close said valve and in a downward direction to place the two orifices in registry to open said valve.

4,570,909
LINING APPARATUS PROVIDED WITH A FOLDABLE SPRAY PIPE

Nobuyoshi Hiroki; Hiroyuki Ikemiya; Ryo Michioka; Tsutomu Ueno, all of Ibaraki; Yasuo Kishimoto, Kitakyushu, and Yosisuke Nagano, Nakama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Kurosaki Refractories Co., Ltd., Fukuoka, both of, Japan

Filed Jul. 24, 1984, Ser. No. 633,950
Claims priority, application Japan, Oct. 13, 1983, 58-158431
Int. Cl.[4] C21B 7/04
U.S. Cl. 266—281 3 Claims



1. A lining apparatus provided with a foldable spray pipe comprising an elevatable vertical support strut supported by a frame, a bifurcated support strut having an upper end thereof connected to the lower end of said elevatable vertical support strut, said bifurcated strut comprising a pair of parallely extending strut elements which define an arm storing space therebetween opening at both sides, a pipe supporting arm foldably connected to the lower end of said bifurcated strut and encasing a spray pipe therein and a protective path formed in each strut element of said bifurcated strut allowing a plurality of lines including a material supply line to pass therethrough, and said apparatus is further provided with an arm joint which

comprises (a) bearings fixedly mounted on the inner sides of said lower end of said strut elements, (b) rotary shafts mountedon corresponding sides of the proximal end of said pipe supporting arm and rotatably received in said bearings thus forming a joint portion, and (c) at least one air purging path formed in said joint portion for injection air to at least one end of a joint surface.

4,570,910

METHOD OF CONSTRUCTING A STEELMAKING LADLE

Thomas A. Geisler, Livermore, Calif., assignor to National Refractories & Minerals Corporation, Oakland, Calif.

Continuation of Ser. No. 472,508, Mar. 7, 1983, abandoned. This application Nov. 29, 1984, Ser. No. 663,736

Int. Cl.[4] C21B *7/04*

U.S. Cl. 266—284 **6 Claims**

1. A method of constructing a steelmaking ladle by lining at least the slagline portion of the ladle with basic refractory material containing from 60% to 80% particles larger than 0.15 mm and from 40% to 20% particles smaller than 0.15 mm, the preceding percentages being based on the total weight of refractory material, the refractory material smaller than 0.15 mm containing from 2% to 20% by weight CaO, based on the total amount of refractory material smaller than 0.15 mm, and SiO_2 in an amount such that the CaO/SiO_2 weight ratio is at least 1.87, the balance of the refractory material smaller than 0.15 mm being MgO plus normal impurities, the refractory being bonded with a phosphate bond.

4,570,911

VIBRATION-DAMPING STRUCTURE

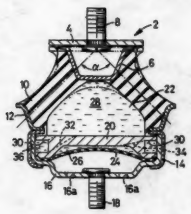
Keizo Konishi, Komaki, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Oct. 28, 1983, Ser. No. 546,423

Claims priority, application Japan, Nov. 13, 1982, 57-199603

Int. Cl.[4] F16M *1/00;* **F16F** *1/36*

U.S. Cl. 267—8 R **17 Claims**



1. A vibration-damping structure disposed in association with a vibration-generating element and a rigid support for connection of the former with the latter in a vibration damping manner, comprising:

an elastic block having therein a cavity which is open at one end of the elastic block;

support means integrally united with said elastic block;

partition means disposed adjacent said one end of the elastic block so as to close said cavity, thereby cooperating with said elastic block to define, on one side thereof, an operating chamber which is located substantially within the mass of the elastic block and filled with an incompressible fluid;

a diaphragm disposed on the other side of said partition means and cooperating with the same to define, on said other side, an equilibrium chamber which is filled with said incompressible fluid, at least a portion of said diaphragm being made of a thin layer of flexible material whereby said equilibrium chamber is variable in its volume; and

passage means for defining an orifice connecting said operating chamber and said equilibrium chamber in fluid communication with each other,

said partition means being made of a rigid material and constructed such that there is substantially no deformation thereof upon input of a vibrational energy into said operating chamber, a dynamic/static ratio of a dynamic spring rate of the vibration-damping structure to a static spring rate of the same being not greater than 2.1 for high-frequency vibrations of higher than 50 Hz.

4,570,912

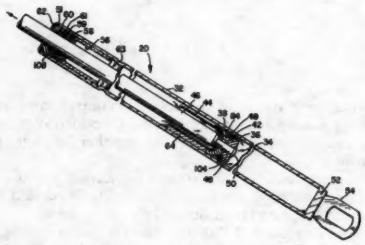
PNEUMATIC SPRING COUNTERBALANCE HAVING IMPROVED DAMPING STRUCTURE

Daniel P. Dodson, Florence, and George C. Ludwig, Marion, both of S.C., assignors to AVM, Inc., Marion, S.C.

Filed Oct. 8, 1982, Ser. No. 433,421

Int. Cl.[3] B60G *11/26*

U.S. Cl. 267—64.15 **20 Claims**

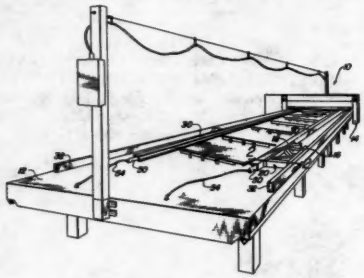


1. A pneumatic spring link comprising: a cylinder assembly with a closed end; a piston assembly in said cylinder with a piston shaft extending from the other end of said cylinder, a cylinder end bushing on said shaft, an annular seal means around said shaft adjacent said end bushing, said piston assembly including a piston means with piston ring means and being fixed on the end of said shaft within said cylinder; the other end of said cylinder including means to retain said bushing within said cylinder: said seal means providing a static seal against said cylinder, and a dynamic seal around said shaft; said piston means and piston ring means providing means enabling metered orifice by-pass flow of fluid across said piston means during the extension stroke and a free flow by-pass fluid communication path across said piston means during the retraction stroke; a predetermined small quantity of oil in said cylinder; a predetermined quantity of gas under at least several atmospheres of pressure in said cylinder; said piston ring means including a bi-directional ring seal retained in the periphery of the piston means and providing a constant bi-directional seal between the piston means and the cylinder inner wall surface; the means enabling flow of fluid across said piston means including a flow passage to the shaft side of said piston radially inward of the bi-directional seal; and means on the shaft side of said piston assembly including a tubular sleeve surrounding said shaft with its interior spaced from said shaft and its exterior spaced from said cylinder wall, and with one end rigidly secured to the shaft side of said piston means to confine fluid flow across said piston means only through said piston means flow passage to and from the interior of said tubular sleeve; the other end of the tubular sleeve being open to provide free fluid flow into and out from said sleeve; said sleeve having a length dimension placing its said other end close to but spaced from said shaft seal means at the extenstion stroke limit position; the predetermined quantity of oil substantially exceeding the free space volume on the shaft side of the piston assembly when the shaft is at the extension stroke limit position; whereby a portion of said oil flowing through the sleeve and the piston assembly is subjected to metered flow to damp the final portion of extension stroke movement.

4,570,913
CLAMPING APPARATUS FOR TRUSS MANUFACTURING EQUIPMENT

Michael C. Rosser, Roanoke, Tex., assignor to Production Equipment & Engineering Co., Fort Worth, Tex.

Filed Jan. 11, 1984, Ser. No. 570,024
Int. Cl.[4] B30B *15/00*
U.S. Cl. 269—22 3 Claims



1. A clamping apparatus operable by a controlled pneumatic source for use on a table in fabricating wood trusses having chords and web components joined together by metal plates comprising:

a first elongated "L" shaped bracket having an outwardly extending flange, means for releaseably fixing said flange of said first bracket to the surface of the table,

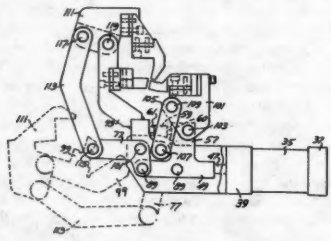
a second elongated "L" shaped bracket means for engaging substantially the full length of a chord of said wood truss, means for movably supporting said second bracket from the surface of said table and from an upwardly extending flange of said first bracket, and

an elongated inflatable conduit positioned between said first and second brackets, said conduit being inflatable between a constricted and inflated position whereby said conduit when inflated forces said second bracket means to move in a direction away from said first bracket to engage the chord of said wood truss applying a pressing force substantially uniformly along the length of said chord.

4,570,914
POWER OPERATED CLAMP

Leland F. Blatt, Fraser, Mich. 48026

Continuation of Ser. No. 362,512, Mar. 26, 1982, Pat. No. 4,496,138. This application Apr. 9, 1984, Ser. No. 598,426
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—32 4 Claims



1. In the fluid power operated clamp for securing a workpiece relative to a workpiece support, including a cylinder having a reciprocal piston and connected piston rod projecting from said cylinder, a hollow body axially aligned with and connected to said cylinder and mounted upon a first support, said body including a pair of opposed spaced side plates with their one ends secured to said cylinder, said piston rod extending into said body between said side plates, pivot bolts extending between said side plates and secured thereto, a clamp arm assembly and linkage pivotally mounted upon said body, the improvement comprising:

said side plates upon their interiors having first opposed guide means;

an elongated rod end movably positioned between said side plates and axially connected to said piston rod;

second guide means mounted upon said rod end transversely thereof movably and supportably mounted within said first guide means;

a pair of cantilever extension links on opposite sides of said rod end intermediate their ends pivotally mounted thereon and reciprocally movable with said rod end;

an arm support at one end pivotally mounted upon said body and intermediate its end pivotally connected to one end of said cantilever extension links;

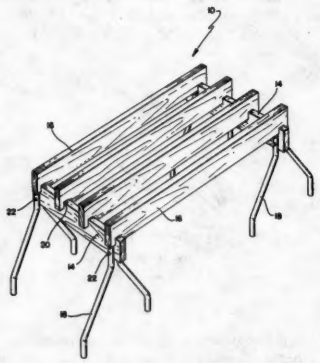
said clamp arm assembly being pivotally mounted at one end upon the other end of said arm support;

and a link interposed between and at its ends pivotally connected respectively to the other end of said cantilever extension links and to said clamp arm assembly, forward movements of said rod end effecting compound pivotal movements of said clamp arm assembly.

4,570,915
WORKBENCH CONSTRUCTION

Michael J. O'Hern, 132 Cedar St., Rehoboth, Mass. 02769

Filed May 14, 1984, Ser. No. 611,013
Int. Cl.[4] F16M *11/00*
U.S. Cl. 269—295 4 Claims



1. A workbench construction comprising:

a. a pair of spaced substantially parallel bench beams each having a plurality of spaced upwardly facing notches therein;

b. a plurality of spaced longitudinally extending main rails each having a plurality of spaced downwardly facing notches therein, said main rails being detachably received in interfitting relation on said bench beams with said main rail notches received in interfitting relation in said bench beam notches, said main rails being supported by said bench beams so that the upper surfaces of said main rails are substantially coplanar with each other and spaced upwardly from the upper surfaces of said bench beams;

c. a plurality of substantially parallel spaced transverse rails received in interfitting relation on said main rails so that the upper surfaces of said transverses rails are substantially

coplanar with each other and spaced upwardly from and substantially parallel to the upper surfaces of said main rails;

d. an elongated longitudinally extending fence member detachably received in interfitting relation on said transverse rails; and

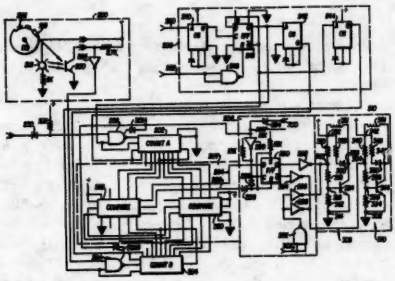
e. leg means attached to said bench beams for supporting said bench beams in upwardly spaced relation to a supporting surface with the upper surfaces of said main rails and said transverse rails in substantially horizontal planes.

4,570,916

DOCUMENT CONVEYING METHOD AND APPARATUS

Callie R. Thompson, Bethlehem, Pa., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 14, 1984, Ser. No. 671,356
Int. Cl.[4] B65H *41/00*
U.S. Cl. 270—52.5 30 Claims



1. A method for conveying at least two superposed strips of documents in a direction of conveyance toward a downstream workstation, each of said documents having a portion thereof which will be a leading edge upon eventual separation of said document from its strip, said strips being conveyed over one another in a direction of superposition whereby the leading edges of documents of one strip alternate in sequence in the direction of conveyance with the leading edge of documents in another strip, said method comprising the steps of:

imparting motion to said strips in said direction of conveyance;

separating in alternating strip fashion leading ones of said documents from their respective strips;

sensing an edge of documents and generating a signal in accordance with the sensing of said edges;

using said signal to determine whether the speeds of motion of said strips are in an acceptable velocity relationship with one another;

using braking means for at least temporarily retarding the motion of at least one of said strips; and,

controlling said braking means whereby the motion of at least one of said strips is retarded for retarding said acceptable velocity relationship of said strips.

4,570,917

SHEET FEEDER FOR A SHEET PROCESSING MACHINE HAVING A CONTINUOUSLY RUNNING SHEET INTAKE

Josef Marass, Seehausen, Fed. Rep. of Germany, assignor to Georg Spiess GmbH, Gersthofen, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 685,156
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401819
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—53 19 Claims

1. In a sheet feeding apparatus adapted for supplying a sheet fed processing machine having a continuously running intake with successive sheets, said apparatus comprising:

retractable front sheet guide means for momentarily halting the sheets, sheet advancing means adapted to accelerate said sheets in step with the feeding operations,

drive means including an intermittently acting one-turn shaft,

said advancing means being driven from said one-turn shaft, said one-turn shaft timing successive feed operations as performed by said apparatus

a transmission driven by said one-turn shaft and responsible for advancing and retarding the sheets in relation to and during the rotation of the one-turn shaft as a function of the size of the sheets,

said transmission including an output shaft moving in steps to drive said advancing means,

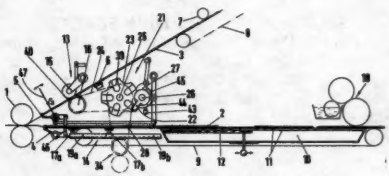
the invention residing in that said apparatus further comprises:

two superposed sheet feeding means adapted to operate in step and to advance sheets at instantaneously equal speed, each such sheet feeding means including

one such sheet advancing means and

such front sheet guide means placed after respective ones of such advancing means in the direction of sheet advance,

said guide means of one sheet feeding means being located over said guide means of said other feeding means,



at least one advancing means including two sets of linearly acting sheet propelling means adapted to engage a sheet one side thereof and feed same

said propelling means in one set being spaced in a direction normal to the direction of sheet advance from propelling means in said other set,

two sets of racks for driving respective ones of said sets of means in said advancing direction reciprocatingly and substantially 180° out of phase with respect to each other

first and second shafts that are parallel to each other

first gear wheels keyed on said first shaft,

second gear wheels bearinged on said second shaft and meshing with said first gear wheels and with racks in one set thereof,

third gear wheels keyed on said second shaft and meshing with racks in the other set thereof,

a driving connection between said shafts to drive one from the other in the same direction of rotation,

and alternate coupling and reversing means for driving one of said shafts directly and the other shaft with a reversing effect.

4,570,918

FEEDER AND BOTTOM STACKER

David Eisler, Littleton, Colo., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 673,072
Int. Cl.[3] B65H *31/08*
U.S. Cl. 271—3.1 6 Claims

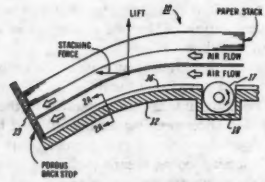
1. A stacker-feeder for inserting sheet under the bottom of a sheet stack or removing sheets from the bottom of the stack individually, comprising:

a paper tray having a curvilinear bottom and a porous backstop;

an air knife positioned in front of said tray and adapted to

supply air to said curvilinear bottom of said tray such that forces are generated on sheets entering the stack as well as the stack itself in order to lift the stack and lift sheets up to the stack;

a vacuum plenum located in a front portion of the bottom of said tray; and,



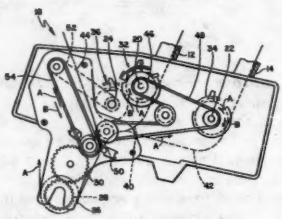
a reversible drive roll positioned within said vacuum plenum and adapted to drive a sheet into and out of the stack once they have been attracted thereto by the vacuum of said vacuum plenum.

4,570,919

SELECTOR FOR MULTIBIN SHEET FEEDER

Lawrence K. Huang, Fremont, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed May 23, 1984, Ser. No. 612,827
Int. Cl.[4] B65H *5/26, 1/28*
U.S. Cl. 271—9 **8 Claims**



7. A driven selector for driving an output shaft having a shaft axis, in a predetermined first direction (B) only upon reversals in the direction of selector rotation, comprising:

a first member which is disposed on said output shaft and is coupled to said shaft at least during rotation of the first member in a first direction (B);

a driver which is rotatably mounted on said shaft so it can rotate relative to said shaft, said driver having a driver frame which carries a drivable input element which can be driven to rotate it and said frame in either of two opposite directions (A) and (B);

said driver having an arm with an inner end pivotally mounted on said driver frame about an axis which is largely perpendicular to said shaft axis, said arm having an outer end forming a pusher;

said first member having a deflector which deflects said arm from an undeflected position to a deflected position when the arm moves in said second direction (A) past said deflector;

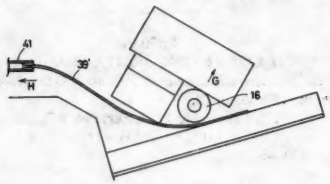
said first member carrying an arm engager which engages the deflected arm when it is moving in said first direction (B) after having reached said deflector and reversed its direction of rotation, said first member also carrying means which moves said arm at least to its undeflected position when the deflected arm continues moving in said second direction (A) after engaging said deflector.

4,570,920

SHEET PAPER ATTRACTING SYSTEM

Toshiki Nishibori, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1983, Ser. No. 464,377
Claims priority, application Japan, Feb. 10, 1982, 57-20467
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—107 **2 Claims**



1. A sheet paper feeding system comprising in combination:

a sheet paper holder for supporting paper sheets stacked thereon;

a sheet paper attracting unit having a first major surface provided with a plurality of air intake openings confronting said paper sheets supported by said sheet paper holder, said plurality of intake openings comprising two large intake openings formed at respective ends of said bottom surface and a plurality of small intake openings formed between said two large intake openings;

a suction air casing having a vacuum chamber formed therein; said suction air casing being disposed opposite said first major surface of said sheet paper attracting unit;

a flexible duct disposed between said sheet paper attracting unit and said suction air casing for movably connecting said sheet paper attracting unit to said suction air casing;

tension means for depressing said sheet paper attracting unit against said paper sheets supported by said sheet paper holder, such that said first major surface of said sheet paper attracting unit contacts a upper most paper sheet included in said paper sheets supported by said sheet paper holder; and

a pressure roller means for depressing said paper sheets supported by said sheet paper holder by a predetermined pressure, said pressure roller means being retractable from contact with said paper sheets during initiation of said sheet feeding system.

4,570,921

CALIBRATED TUBULAR ELASTIC EXERCISING DEVICE

Frank Arnold, 6555 2nd Ave. SW, Naples, Fla. 33999

Filed Dec. 19, 1983, Ser. No. 563,093
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 **2 Claims**

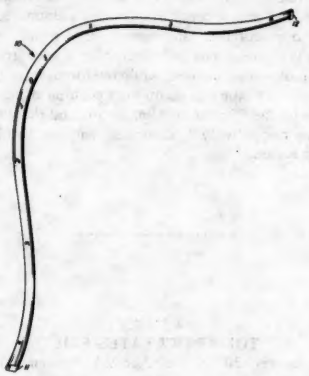
1. An exercise device consisting of an elongated hollow tube made entirely of pure rubber, said tube having a length of approximately 75 inches, an outer diameter of $\frac{7}{8}$ths of an inch, and an inner diameter of $\frac{3}{4}$ths of an inch, and said tube being calibrated by the following numerals being permanently imprinted on the outer surface of the device:

0 imprinted at the midpoint between the ends of the device;

1 imprinted 10 inches from the 0 measured toward each end;

2 imprinted 14$\frac{1}{2}$ inches from the 0 measured toward each end;

3 imprinted 25½ inches from the 0 measured toward each end; and



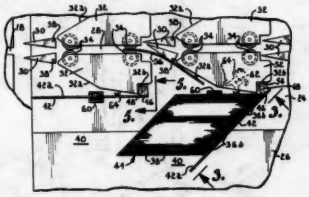
4 imprinted 34½ inches from the 0 measured toward each end.

4,570,922

ENVELOPE STACKING ARRANGEMENT FOR MAIL SORTING MACHINES

Roy Akers, Olathe, Kans., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jun. 17, 1983, Ser. No. 505,296
Int. Cl.⁴ B65H *29/40, 29/60*
U.S. Cl. 271—178 **20 Claims**



1. An envelope storage arrangement for a mail sorting machine having means for conveying envelopes one at a time along an envelope track with the envelopes oriented generally vertically and means for directing selected envelopes along a predetermined path from the envelope track into a storage area, said storage arrangement comprising:

a generally horizontal surface forming a floor of the storage area for receiving lower edges of the incoming envelopes;

a substantially planar swing plate mounted in the path of the incoming envelopes for pivotal movement about a substantially vertical axis between a first position when the storage area is empty and a second position when the storage area is full, said plate in the first position thereof being oriented generally parallel to envelopes entering the storage area and said plate being progressively pivoted toward the second position by incoming envelopes and having an envelope confronting surface located to intercept incoming envelopes and to maintain the envelopes in a stack with a leading edge of each envelope engaging said envelope confronting surface and being maintained thereby in a generally vertical orientation, said plate having an end remote from said axis which moves away from the envelope track as the plate is pivoted toward the second position; and

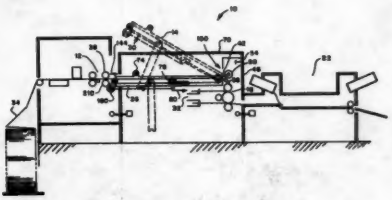
means for urging said swing plate toward the first position to maintain said envelope confronting surface against the leading edges of the envelopes stacked against said swing plate in the storage area.

4,570,923

CONVEYING APPARATUS

Clinton E. Hooper, Brookfield, and Harold Silverman, Wilton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 19, 1984, Ser. No. 683,753
Int. Cl.⁴ B65H *5/02*
U.S. Cl. 271—275 **6 Claims**



1. A sheet conveying apparatus for transferring successive sheets of paper from a first sheet processing machine having a pair of substantially vertically oriented sheet feed rollers adjacent an output end thereof to a second sheet processing machine having an input end located at the end thereof opposite from the end disposed adjacent to the output feed rollers of the first sheet processing machine, said sheet conveying apparatus comprising:

A. an elongate frame pivotally connected to said second sheet processing machine adjacent the input end thereof and being normally disposed in a substantially horizontal position so that said frame normally overlies said second sheet processing machine,

B. sheet conveying means mounted on said frame and extending substantially the length thereof for conveying sheets from said output end of the first sheet processing machine to said input end of the second sheet processing machine,

C. drive means operatively connected to said conveying means and being movably mounted on the free end of said frame for movement between an extended position in which said drive means is engaged in driving relationship with the lower feed roller of said pair of feed rollers and is in interferring relationship with both said lower and upper feed rollers thereby preventing upward movement of said free end of said frame, and a retracted position in which said drive means disengaged from said lower feed roller and is out of interferring relationship with said lower and upper feed rollers thereby permitting upward movement of said free end of said frame, and

D. manually operable means for selectively moving said drive means from said extended position to said retracted position whereby said sheet conveying apparatus can be pivotally raised to an inclined position to facilitate operator access to the space beneath the sheet conveying apparatus.

4,570,924

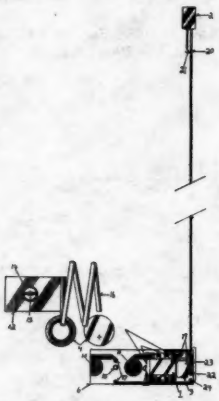
FIREFLY ILLUSION

Keith Connelly, 344 Gertrude St.5, Syracuse, N.Y.

Filed Mar. 2, 1983, Ser. No. 471,234
Int. Cl.³ A63J *21/00*
U.S. Cl. 272—8 P **1 Claim**

1. A device which effects the illusion of the levitation and animation of a miniature light source comprising flesh colored means for receiving the end of a finger, miniature circuit board means fixed to said flesh colored means, said circuit board means being hidden from the view of an audience when the user's finger tip or thumb is inserted into said flesh colored

means and the attitude of the finger or thumb is properly positioned, a miniature light source, an elongated stiff but resilient wire means of a flat black color connected to one end to said circuit board means and at the other to said miniature light source for carrying current from said circuit board means to said miniature light source and supporting said light source



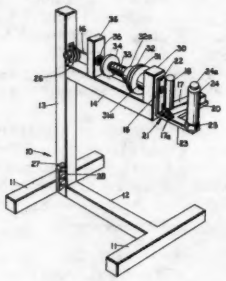
in flexible levitation, and control and power means in said circuit board means for activating and energizing said miniature light source through said wire means, wherein under darkened lighting conditions the miniature light source can be made to float or undulate with no apparent perceptible means of support or activation.

4,570,925

DEVICE FOR EXERCISING MUSCLES ASSOCIATED WITH ELBOW TENDONITIS, INCLUDING ALSO THE HAND AND WRIST

Ronald W. Kock, Cincinnati, and Charles E. Schuster, Fairfield, both of Ohio, assignors to Bio Mechanisms, Inc., Fairfield, Ohio

Filed Oct. 25, 1984, Ser. No. 664,514
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—67 **14 Claims**



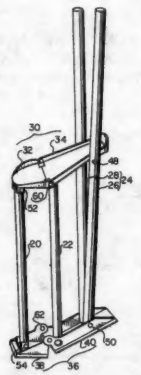
1. A device for exercising muscles associated with elbow tendonitis including also the hand and wrist, said device comprising a main frame including and first force means urging said first handle away from said second handle and second force means resisting rotational movement of said handle means; whereby a handgripping - squeezing action may be effected by a user gripping both handles with one hand and pulling said first handle towards said second handle with said hand in opposition to said first force means; whereby a forearm twisting action may be effected by a user gripping said second handle with one hand while the forearm is substantially aligned with said first and second handles and rotating said handle means in opposition to said second force means; whereby a wrist casting action may be effected by a user gripping said second handle with one hand while the forearm is substantially at right angles to the last mentioned position of said forearm; and whereby the forearm twisting action and the wrist casting action may respectively be combined with the handgripping - squeezing action.

4,570,926

TOE-ARTICULATED STILT

Gary Ensmenger, 307 N. 9th, Apt. #1, Broken Arrow, Okla. 74012

Filed Aug. 9, 1983, Ser. No. 521,646
Int. Cl.[4] A63B *23/04, 25/00*
U.S. Cl. 272—70.1 **13 Claims**



1. A toe-articulated stilt comprising:

a toeholder means,

a heelholder means hinged with a first hinge means to said toeholder means such that the combination of said toeholder means and said heelholder means fit the sole of the foot of the wearer when said stilt is worn;

a heelbase means;

a toebase means hinged with a second hinge means to said heelbase means;

a toecolumn, one end of which is hinged with a a third hinge means to the forward end of said toeholder means, the other end of which is hinged with a fourth hinge means to the forward end of said toebase means;

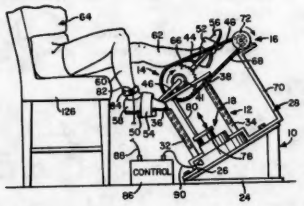
a solecolumn, one end of which is hinged with a fifth hinge means to the forward end of said heelholder means, the other end of which is hinged with a sixth hinge means to the forward end of said heelbase means;

a heelcolumn, one end of which is hinged with a seventh hinge means to the rear end of said heelbase means, the other end of which is hinged with an eighth hinge means attached between said heelcolumn means and the rear end of said heelholder means wherein the eighth hinge means is located substantially level with the heel of the foot of the wearer.

4,570,927
THERAPEUTIC DEVICE

Jerrold S. Petrofsky, Beavercreek; Chandler A. Phillips, Tipp City, and Harry H. Heaton, III, Beavercreek, all of Ohio, assignors to Wright State University, Dayton, Ohio

Filed Dec. 15, 1983, Ser. No. 561,769
Int. Cl.[4] A63B *21/00*; A61H *1/02*
U.S. Cl. 272—73 13 Claims



1. A therapeutic device for reversing osteoporosis in human limbs comprising:

means for supporting at least one human limb;

means for actuating said supporting means to move a supported limb repeatedly along a predetermined path;

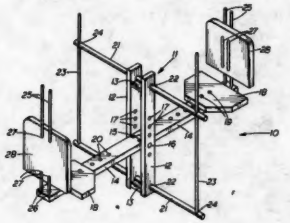
means for generating driving vibrations for vibrating said supporting means, whereby said driving vibrations are transmitted from said supporting means to a supported limb; and

means for sensing an amplitude of vibrations felt by bones of a supported limb at said supported limb and regulating an amplitude of said driving vibrations in response thereto, thereby maintaining said amplitude of said felt vibrations within a predetermined range as a supported limb is moved along said path.

4,570,928
PUSH-PULL SWING

Jack L. Smith, 10518 Ocean Dr., Baytown, Tex. 77520

Filed Jan. 24, 1983, Ser. No. 460,741
Int. Cl.[3] A63G *9/00*
U.S. Cl. 272—87 1 Claim



1. A push-pull swing comprising in combination

a frame having at least one horizontally extending bar having a pair of vertically extending apertures at one end thereof,

a pair of vertically extending substantially parallel ropes secured one in each of said apertures and adapted to be secured to an elevated support,

a pair of parallel spaced-apart vertically extending bars of substantially equal length pivotally secured at their mid-section on opposite sides of said horizontally extending bar and spaced a substantial distance from said one end,

said vertically extending bars each having a plurality of vertically spaced horizontally extending and axially aligned openings therethrough,

said pair of vertically extending bars having upper and lower reinforcing cross members, of substantially greater length than the spacing therebetween, secured in the uppermost and lowermost openings thereof with outer end portions extending outward therefrom and having vertically extending apertures therein,

said connection of said horizontal bar to said vertical bars comprising a pin passing therethrough and through selected openings of said vertical bars intermediate said uppermost and lowermost openings and providing a releasable and pivotal connection at a vertically adjustable position,

said horizontally extending bar having a plurality of longitudinally spaced vertical apertures therein,

a seat member adjustably secured to said horizontal bar in said last named apertures,

a back rest member having holes through which said pair of ropes are threaded whereby said backrest member may be vertically adjusted and retained in an adjusted position, and

another pair of vertically extending ropes secured one in each of said apertures in the ends of said cross members and adapted to be secured to an elevated support, whereby said swing is supported by said pairs of spaced vertical ropes facilitating horizontal movement thereof by the occupant pulling on said upper cross member end portions and pushing with the feet on said lower cross member.

4,570,929
PLASTIC EXERCISING DEVICE AND ITS METHOD OF MANUFACTURE

Nancy A. Shoemaker, Woodbridge, Va., assignor to Trim, Inc., Woodbridge, Va.

Filed Aug. 31, 1983, Ser. No. 528,131
Int. Cl.[4] A01B *23/00*
U.S. Cl. 272—137 7 Claims

1. A resistance exercise device comprising:

a central elongated portion made of stretchable, flexible flat resistance material and handles provided at opposite ends of said elongated portion, said handles being connected to said central portion and being formed as loops of said material through which a user can insert his hands, said central portion and said handles being formed of a single elongated piece of said material having a uniform predetermined width which has its ends fastened together to form a loop, with said handles being formed by opposing portions of said loop being fastened together at opposite ends of said loop, said central portion being formed by two overlapping plies of said material.

4,570,930
SYSTEM, METHOD, AND STATION INTERFACE ARRANGEMENT FOR PLAYING VIDEO GAME OVER TELEPHONE LINES

Thomas G. Matheson, Madison, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 3, 1983, Ser. No. 538,342
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—1 E 20 Claims

1. A system for playing action video games over a telephone network,

said video game system including at least a first computer system,

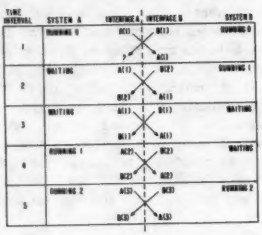
said first computer system including an input device adapted to provide position data to said computer system; and

an interface device adapted to permit said first computer system to be interconnected to one or more computer systems over a telephone network, and

characterized in that

said first computer system further comprises:

means responsive to said input device for exchanging position data between said first computer system and said telephone network during a predetermined game generation time interval to transmit position data from said first computer system to said telephone network and to receive position data from said telephone network, said exchanged position data for use in the next generation time interval in said first and said other computer systems,



means for synchronizing said exchange of position data so that the position data exchanged in said generation time interval between said first computer system and said telephone network corresponds to the same game generation; and

means responsive to the synchronized position data exchanged during the preceding game generation time interval for running a current generation on said first computer system during said current generation time interval

wherein said synchronizing means comprises:

means for identifying the order of succession of the generations of transmitted and received position data; and

means responsive to the identification of said transmitted position data and said received position data being the same for using said transmitted position data and said received position data in the next generation of said first computer system.

4,570,931

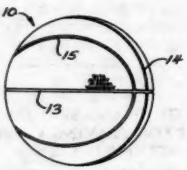
BASKETBALL

Robin A. Martin, Park Ridge, Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.

Filed Apr. 3, 1984, Ser. No. 596,423

Int. Cl.[4] A63B *41/08*

U.S. Cl. 273—65 EG **9 Claims**



1. A basketball having a generally spherical surface with a plurality of triangular projections for increasing the ability of a player to grip the basketball, each of the triangular projections having a substantially flat triangular upper surface and three side walls which extend downwardly between the substantially flat upper surface of the projection and the spherical surface of the basketball, the triangular upper surface being defined by three straight sides which provide three pointed apexes.

4,570,932

HOCKEY STICK HAVING WEDGE INSERT IN THE BLADE

George R. Cote, 339 Huntbourne Hill N.E., Calgary, Alberta, Canada (T2K 3Y5)

Filed Apr. 23, 1984, Ser. No. 603,183

Claims priority, application Canada, Apr. 28, 1983, 426963

Int. Cl.[4] A63B *59/14*

U.S. Cl. 273—67 A **5 Claims**

1. An ice hockey stick comprising an elongated shaft portion and an elongated generally rectangular blade portion extending from one end of said shaft portion and terminating at a distal end said blade portion having separate wedge means located within said blade portion at the distal end thereof; said wedge means providing a curved front hitting surface while at the same time maintaining a straight rear hitting surface on said blade.

4,570,933

RACKET WITH KNOTTING BLOCKS FOR MOUNTING STRINGS

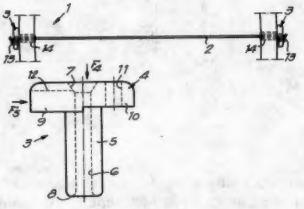
Hugo R. Michiels, Hamstraat 2, 9170 Waasmunster, Belgium

Filed May 23, 1984, Ser. No. 613,166

Claims priority, application Belgium, Sep. 27, 1983, 2/60213; Mar. 20, 1984, 2/60367

Int. Cl.[4] A63B *51/12*

U.S. Cl. 273—73 D **8 Claims**



2. A tennis racket having a frame with a plurality of bores extending from an outside surface to an inside surface, a handle on the frame and netting in the frame, the netting being formed by substantially separate strings, each of which being fastened under tension in the frame on at least one of its ends by means of a knotting block, said knotting block comprising:

(a) a substantially T-shaped member having a substantially cylindrical shank and a substantially parallelepiped-shaped head having a pair of legs, said shank being in-

serted from the outside of the frame into a corresponding bore in the frame;

(b) said shank having a central passage for receiving a string therethrough;

(c) said head having means for receiving an end of said string, said string extending through said central passage in said shank, through said receiving means and under a portion of the string that extends from the central passage to thereby form a looped string end, whereby tension on the string operates to lock the looped string end;

(d) said receiving means including, in one leg of the head of said knotting block, a second passage for the string, said second passage extending parallel to the central passage extending through the shank; and

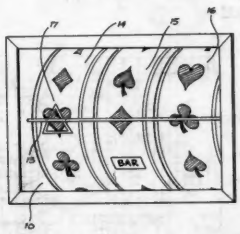
(e) the underside of said one leg of the head wherein said second passage is provided being staggered with respect to the underside of the opposite leg over a distance that corresponds to the thickness of the string, thereby providing space for the wrapping of said string about said one leg.

4,570,934

POKER MACHINES

Richard E. Smyth, Sydney, Australia, assignor to Ainsworth Hominees Pty. Ltd., Australia

Filed Nov. 21, 1984, Ser. No. 673,608
Claims priority, application Australia, Dec. 23, 1983, PG2974
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—143 R **3 Claims**



1. A poker, slot or fruit machine having a plurality of symbol display elements each having a plurality of symbols, said machine being normally operative in a play cycle to display one symbol from each display element sequentially in a viewing area, said display elements being arranged to display in said viewing area at the end of a play cycle one symbol from each said display element to form a combination of said symbols which can have a predetermined score value, characterised in that at least one designated symbol is provided on at least one display element, there being means to detect the appearance of said designated symbol in the viewing area at the end of a play cycle and to give a visible indication of said designated symbol having been displayed, means to record and indicate the number of occurences of the display of said designated symbol after a predetermined number of play cycles and means to cancel the said visible indication before the next play cycle is commenced.

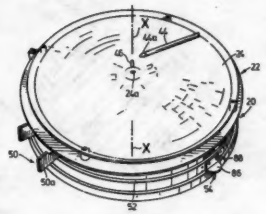
4,570,935

MULTIPLE MAZE GAME

Giancarlo Stefanini, 90 Yorkleigh Ave., Weston, Ontario, Canada (M9P 1Y7)

Filed Oct. 25, 1983, Ser. No. 545,282
Int. Cl.[3] A63F 9/06
U.S. Cl. 273—153 R **14 Claims**

1. A game including a maze through which playing pieces can be moved between a central location and a plurality of outer locations, wherein the maze is defined at least in part by a series of concentrically arranged annular members extending about an axis at said central location, and wherein means is provided supporting said members for turning movement with respect to one another about said axis from predetermined respective starting positions, each said member defining a plurality of gates through which a playing piece can be moved, and intervening blind compartments, the gates being spaced around the member and extending between inner and outer circumferences thereof, and the gates being arranged to co-operate with similar gates of adjacent members in each of a plurality of predetermined relative angular positions of the members to form a series of respectively different paths through the maze, whereby the configuration of the maze can be changed by turning the annular members to different angu-



lar positions about said axis, and wherein the game further includes means for simultaneously moving at least some of said members from their starting positions each through a predetermined angular amount to a position in which the members together define a path through the maze, said means comprising a key, and means adapted to support the key in a generally radial position below said annular members for movement through a predetermined angular amount from a starting position to an advanced position, wherein the key and annular members are provided with co-operating formations arranged to cause the required respective angular movements of relevant ones of said members through said predetermined angular amount in response to said movement of the key.

4,570,936

JIGSAW PUZZLE

Sue M. Meiser, Lafayette, and Michael F. Cassidy, West Lafayette, both of Ind., assignors to Warren Company, Lafayette, Ind.

Filed Apr. 27, 1984, Ser. No. 604,457
Int. Cl.[4] A63F 9/12, 9/10
U.S. Cl. 273—157 R **4 Claims**

1. A jigsaw puzzle comprising a plurality of puzzle pieces which are adapted to interlock together to form a solid surface without openings or slots, each of the puzzle pieces having at least one male interlock projection and at least one female interlock recess, the puzzle pieces including first and second groups of puzzle pieces, each of the puzzle pieces of the first group having a straight edge adjacent a male interlock projection, each of the puzzle pieces of the second group having a straight edge adjacent a female interlock recess, each of the puzzle pieces of the first group being interlockable with one of

the puzzle pieces of the second group to form a two-piece part having an open slot defined by the straight edges of the two interlocked pieces, whereby a plurality of said two-piece parts can be interfitted together by said slots to form a three-dimensional part.

4,570,937

TWO PIECE SOLID GOLF BALL

Mikio Yamada, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Sep. 13, 1983, Ser. No. 531,564
Claims priority, application Japan, Sep. 13, 1982, 57-160563
Int. Cl.[4] A63B *37/12*
U.S. Cl. 273—220 3 Claims

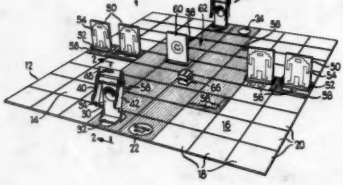
1. A two piece solid golf ball comprising a solid core and a cover for covering the solid core, said solid core having a distribution of hardness such that the hardnesses measured by a JIS-C hardness tester are from 72 to 78 at the surface, from 77 to 83 at the position 5 mm. apart from the surface, from 72 to 80 at the position 10 mm. apart from the surface, from 67 to 75 at the position 15 mm. apart from the surface, and not more than 75 at the residual center portion.

4,570,938

BOARD GAME HAVING PIECES WITH PIVOTAL ARM

Michael J. Ferris; Paul H. Wise, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jul. 15, 1983, Ser. No. 513,778
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—243 7 Claims



1. A board game comprising:

a game board having a plurality of congruent playing spaces with each space being adjacent to at least one other space;

a primary playing piece and at least one secondary playing piece;

each playing piece having a base and an upright body portion connected to the base;

the primary and secondary pieces being moveable from one playing piece space to an adjacent playing space with the base of each fitting within and resting upon the playing space;

the primary playing piece and each secondary playing piece moveable into a respective position on an adjacent space with the primary playing piece and the secondary playing piece oriented to face each other;

each secondary playing piece base having a dimension parallel to the facing orientation;

the upright body portion of each secondary playing piece having a height approximately three times as great as the dimension of the base parallel to the facing orientation;

shooting means mounted on the primary playing piece for movement relative to the base from a neutral position to a shooting position for hitting and knocking over a secondary playing piece that is on an adjacent space and facing the primary playing piece;

the primary playing piece including player operable tab means for actuating movement of the shooting means relative to the base;

the shooting means being pivotally mounted to the upright body portion of the primary playing piece;

the shooting means including an arm generally aligned with the upright body portion in the neutral position and substantially transverse to the body portion in the shooting position; and

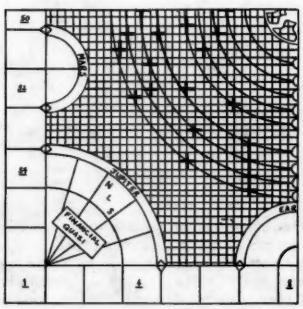
the arm has a free end that is thrust out beyond the space when in the shooting position.

4,570,939

BOARD GAME

David A. Tourville, 282 E. Wyoming, St. Paul, Minn. 55107, and Charles D. Borden, 1891 Grand Ave., St. Paul, Minn. 55105

Filed Nov. 21, 1983, Ser. No. 553,965
Int. Cl.[4] A63F *3/04*
U.S. Cl. 273—253 1 Claim



1. A board game combining financial and military skill and strategy, said game comprising:

a game board having an outer financial pathway, an inner military pathway, and a plurality of planetary pathways linking said financial pathway to said military pathway;

said financial pathway comprising a plurality of squares representing industries which may be purchased and owned by players, and a plurality of other squares giving, directly or indirectly, instructions relating to the play of the game;

said military pathway comprising a representation of the Sun and the planets of the solar system, and the respective orbits of each of said planets around said Sun;

said planetary pathways comprising representations of the planets separate and distinct from the aforementioned representations of the planets in said military pathway, said planetary pathways being positioned between said financial pathway and said military pathway, each of said planets in said planetary pathways comprising sections which may be purchased and owned by players and which may be used as launching sites for spaceships;

game markers for indicating movement of players along said pathways;

game markers of a different shape for indicating ownership of said industries or said planet sections;

game markers of a still different shape, to be used as planetary markers, said markers allowing each of said planets in said military pathway to move to different positions in its respective orbit, by moving said markers along each of said orbits;

game markers of still different shapes, representing military equipment;

chance means for determining the movement of said game markers;

indicia giving instructions relating to the play of the game;

means for determining the relative wealth of the players;

the object of said game being to conquer the solar system by the following means:

moving along said financial pathway to acquire industries thereon and thus generate income;

using said income to purchase planets, or sections thereof, on said planetary pathways;

purchasing and launching spaceships from said planet sections to make military conquests of planet sections owned by other players;

the winner being the player who succeeds in conquering the entire solar system or an agreed upon portion thereof.

4,570,940

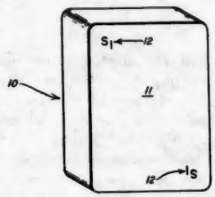
OBVERSE/REVERSE DOMINO GAME SET

Stewart M. Lamle, 55 W. 86th St., New York, N.Y. 10024

Filed Apr. 25, 1984, Ser. No. 603,706

Int. Cl.[4] A63F *1/00*

U.S. Cl. 273—296 **3 Claims**



1. A game set consisting of a plurality of individual pieces, each of said pieces having game playing indicia on first and second opposite sides thereof, wherein N forms of indicia are used on the pieces of the game set and N is equal to or greater than 3, wherein each piece displays an indicia combination which is unique in the game set, and wherein the total number of pieces in the set is equal to $(N)(N+1)/2$.

4,570,941

BROADHEAD ASSEMBLY FOR ARROW

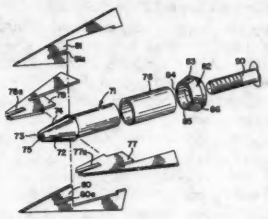
Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Company, Columbus, Nebr.

Continuation-in-part of Ser. No. 375,487, May 6, 1982, Pat. No. 4,468,038. This application Aug. 27, 1984, Ser. No. 644,243

Int. Cl.[4] F41B *5/02*

U.S. Cl. 273—422 **3 Claims**

1. In a broadhead assembly for an arrow, said broadhead assembly being of the type including a hub assembly adapted for being retained on the leading end of an arrow shaft, and opposing pairs of broadhead blades mountable in perpendicular relation on said hub assembly and extending radially outwardly therefrom; an improvement wherein said hub assembly includes a central hub with a leading end of said hub having slot means extending axially therein for receiving a forward mounting portion of each said blade, the leading point of each said blade extending forwardly of said leading end of said hub, said opposing pairs of broadhead blades including a pair of primary opposing blades having ends thereof adapted for juxtaposed overlying relation for added strength to the tip of said broadhead, and a pair of secondary opposing blades also adapted for juxtaposed overlying relation and each having a



leading end thereof adapted for abutting a side of a primary blade adjacent said leading end thereof.

4,570,942

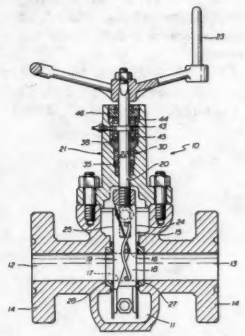
DUAL DIAMETER VALVE STEM PACKING

Robert J. Diehl, Wallis; F. Harold Hollister, and Danny S. Meyer, both of Richmond, all of Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 22, 1985, Ser. No. 725,721

Int. Cl.[4] F16J *15/10*; F16K *41/00*

U.S. Cl. 277—12 **5 Claims**



1. A packing arrangement for a valve stem which extends through a packing chamber formed in the valve stem bore of a valve housing having a flow passage therethrough and a valve element secured to the valve stem and mounted within said housing for opening or closing the flow passage, said packing chamber being provided with packing stops at its opposite ends and characterized by a stepped dual diameter configuration formed by successive enlargements of the valve stem bore, with one enlargement of the bore providing a first packing chamber section located nearest the flow passage and the other enlargement providing a second packing chamber section of larger diameter and cross-sectional area than said first packing chamber section which is adjacent thereto, one of said packing stops being an inner packing stop exposed to the fluid pressure of the flow passage and the other packing stop being an outer packing retainer ring located at the other end outwardly of the inner packing stop with respect to the flow passage and being axially adjustable with respect to said bore, said packing arrangement further including:

a primary packing assembly positioned within the first packing chamber section between the valve stem and the chamber wall is surrounding relation to said valve stem and in engagement with said inner packing stop and fabricated of layers of elastomeric or polymeric materials suitable for providing primary sealing under normal temperature operating conditions;

a rigid packing support ring loosely received about the valve stem and positioned within the second packing chamber section outwardly of said low temperature packing assembly and in engagement therewith;

a secondary packing assembly positioned within the second packing chamber section between the valve stem and the wall of the packing chamber in surrounding relation to the valve stem and located outwardly of said support ring so as to be sandwiched between said outer packing stop and said support ring and fabricated of materials suitable to provide sealing under abnormally high temperatures, said outer packing retainer ring being axially adjusted to a position whereby said primary packing assembly is energized in sealing contact with the valve stem and chamber wall at normal temperature conditions below the decomposition temperature of the primary packing materials, and said secondary packing assembly is energized in sealing contact with the valve stem and chamber wall to provide a sealing relationship therewith at abnormally high temperature conditions which impair the stem sealing relationship of the primary packing assembly so that the packing structure will not leak flow passage fluid when subjected to abnormally high temperatures and pressures.

4,570,943

SEALING FLASHING FOR BUILDINGS WITH INTERLOCKING RING MEMBERS

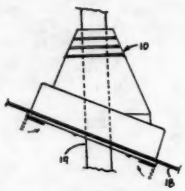
David G. Houseman, Richmond, and Gary J. Binding, Boronia, both of Australia, assignors to John Deks Australia Pty. Ltd, Bayswater, Australia

Filed Feb. 27, 1985, Ser. No. 706,329

Claims priority, application Australia, Feb. 29, 1984, PG3848

Int. Cl.[4] F16J *15/02;* **F16L** *41/06;* **E04D** *13/14*

U.S. Cl. 277—12 **13 Claims**



1. A device for flashing about a pipe or conduit passing through a roof or wall,

a first member having an aperture therethrough for a pipe or conduit to pass through and a continuous first abutment surface extending about said aperture, a second member having an aperture therethrough for the pipe or conduit to pass through and a continuous second abutment surface extending about said aperture, said apertures and abutment surfaces being arranged so that when the first and second members are assembled to a pipe or conduit that extends through the respective apertures, the first and second abutment surfaces are in an opposing face to face substantially parallel relation substantially transverse to the axis of the pipe or conduit, means to secure the first and second members together in said assembled relation with a sheet of flexible material therebetween and through which the pipe or conduit also extends and a sleeve of flexible resilient material adapted at one end for attachment to the first member so that a pipe or conduit extending through the first and second members also extends through the sleeve, the other end of the sleeve being adapted to sealably engage the external surface of the pipe or conduit extending therethrough, said one end of the sleeve including a portion located in use to be compressed between the sheet and one of the members when the first and second members are secured together in said assembled relation.

4,570,944

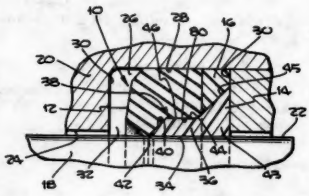
SEAL ASSEMBLY WITH REDUCED WEAR LOW PRESSURE SEALING RING

Henry A. Traub, Pacific Palisades, Calif., assignor to W. S. Shamban & Company, Santa Monica, Calif.

Filed May 15, 1985, Ser. No. 734,565

Int. Cl.[4] F16J *15/24, 15/32*

U.S. Cl. 277—121 **8 Claims**



1. A low pressure seal ring adapted for use in combination with a high pressure seal ring to provide a seal assembly which is capable of sealing first and second relatively reciprocating surfaces at both high and low pressures, wherein said high pressure seal ring includes an inner sealing surface for sealing contact with said first reciprocating surface and a low pressure seal ring support portion, said low pressure seal ring support portion including an outer low pressure seal ring support surface having an inclined seal lip support surface which tapers inward towards said inner sealing surface, said seal lip support surface having a left end which terminates at said inner sealing surface to provide a high pressure seal apex adjacent said first reciprocating surface and a right end, said low pressure seal ring support surface further including an axial low pressure seal body support surface which is substantially parallel to said inner sealing surface, said seal body support surface having a left end which meets the right end of said seal lip support surface, wherein said low pressure seal ring comprises an annular seal ring body comprising:

a seal lip portion having a bottom seal lip surface adapted to be supported by the seal lip support surface of said high pressure seal ring, said seal lip surface including an annular sealing tip at its left end said sealing tip extending out past and adjacent to the left end of said seal lip suppport surface for sealing contact with said first reciprocating surface, said seal tip including a first apex, said seal lip portion further including a top seal lip surface, said top seal lip surface including an annular lobe having a second apex, said first and second apexes providing increased sealing contact between said low pressure seal lip and first and second reciprocating surfaces; and

a seal body portion having a left part integral with said seal lip portion and a right part, said seal body portion adapted to be positioned between the groove bottom and the seal body support surface of said high pressure seal ring for biasing said high pressure seal ring against said second reciprocating surface.

4,570,945

PISTON RING HAVING SHAPE OF AN ELLIPSE OR AN ELONGATED CIRCLE

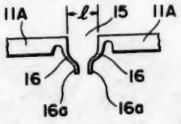
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

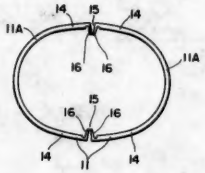
Filed May 16, 1983, Ser. No. 494,646

Claims priority, application Japan, May 20, 1982, 57-85550; May 22, 1982, 57-86966

Int. Cl.[4] F16J 15/32

U.S. Cl. 277—197 11 Claims





1. A piston ring for an internal combustion engine, said piston ring being metallic and having an essentially elliptical shape, said piston ring further comprising a plurality of segments arranged in end-to-end manner, and including at least first and second arc segments, wherein each end of said first and second arc segments comprises a bendable projection which bends to exert a force against the end of a neighboring segment, said force tending to cause said first and second arc segments to move apart from each other.

4,570,946

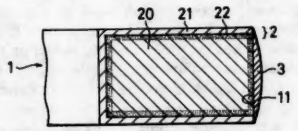
NITRIDED PISTON RING WITH OUTER LAYER ON SURFACE

Takeshi Tsuchiya, and Shuji Samejima, both of Saitama, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,091

Int. Cl.[3] F16J 9/00; F02F 5/00

U.S. Cl. 277—216 9 Claims



1. A piston ring comprising; a piston ring body formed of one of steel and cast iron; nitriding layer formed over said ring body surfaces, said nitriding layer including a diffusion layer and a compound layer provided over said diffusion layer; at the outer peripheral portion of said piston ring body, at least said compound layer being removed; and one of plating and spraying layer formed on the outer peripheral surface of said piston ring body.

4,570,947

GAS SEALING AND FLUID SCAVENGE APPARATUS

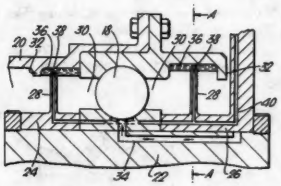
Stanley Smith, Gloucestershire, England, assignor to Rolls-Royce Limited, London, England

Filed Jul. 6, 1984, Ser. No. 628,280

Claims priority, application United Kingdom, Jul. 8, 1983, 8318582

Int. Cl.[4] F16J 15/02

U.S. Cl. 277—225 7 Claims



1. A hydraulic gas seal comprising a rotatable sump chamber into which liquid is discharged and centrifuged radially outward to form an annulus of liquid, a fixed structure arranged concentrically within the sump chamber provided with a circumferentially extending radially outwardly directed flange which, in use, contacts the annulus of liquid and effects a weir and thus forms a gas seal between the two sides of the flange, and at least one conduit, incorporated in the fixed structure, for removal of liquid from the chamber, said conduit terminating in an orifice which, in use, at least partially is submerged in the annulus of liquid, and said orifice being arranged to utilise the ram effect of the rotating liquid to force liquid through it and away from the sump via the conduit.

4,570,948

PLASTIC PROFILED SEALING ELEMENT FOR HOUSEHOLD REFRIGERATION APPLIANCES

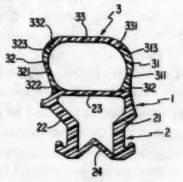
Ernst Wunderlich, Hof, and Gerd Röbl, Selb, both of Fed. Rep. of Germany, assignors to Rehau AG and Co., Rehau, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,442

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1983, 3327692

Int. Cl.[4] F16J 15/00

U.S. Cl. 277—226 14 Claims



1. A profiled sealing element made of plastic for household refrigeration appliances, comprising: an anchor member which is made of plastic material, said anchor member having a covering wall; and a sealing bellows made of plastic material which is set by softeners so as to be continuously flexible, said sealing bellows having a hose-shaped cross section and being provided with a covering wall having edges and two side walls which are connected to the covering wall of the anchor member so that the sealing bellows and the anchor member form a unit, wherein each of the two side walls of the sealing bellows has a wall cross section which converges from the region of the connection of the side wall with the covering wall of the anchor member to approximately half the height of the sealing bellows, so that the side wall becomes increasingly thinner, and

which then increases to the edges of the covering wall of the sealing bellows, so that the side wall again attains approximately its initial thickness, and wherein said softeners are such that the side walls, on the one hand, and the covering wall of the sealing bellows, on the other hand, are kept flexible by softeners having different characteristics.

4,570,949

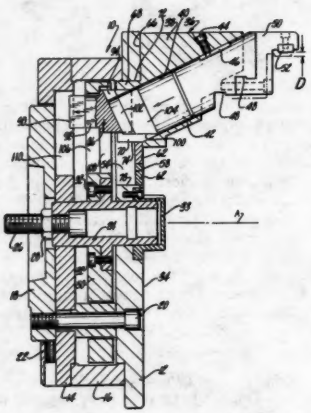
CHUCK

Longine V. Morawski, and Lawrence V. Morawski, both of P.O. Box 631, Roseville, Mich. 48066

Filed Jun. 27, 1984, Ser. No. 624,921

Int. Cl.[4] B23B *31/16, 31/40*

U.S. Cl. 279—1 DA **7 Claims**



1. A chuck adapted to be mounted on the spindle of a machine tool for rotatably supporting a workpiece, comprising: a body having a central axis, said body having a front plate and a back plate rigidly connected together in axially spaced relation to define a chamber therebetween, said front plate having a plurality of circumferentially spaced openings therein, a plurality of individual support blocks fixedly mounted on said front plate and overlying each opening, each support block having a bore extending therethrough at an acute angle to said central axis, each block being adapted to be mounted on said front plate at a plurality of positions spaced radially different distances from said axis, each opening in the front plate being of sufficient radial extent to register with the rear end of said bore in each of said radially different positions, each support block having a jaw rod mounted in said bore for sliding movement therein, the outer end portion of each jaw rod having a workpiece-gripping jaw thereon, the inner end portion of each jaw rod extending through an associated one of said openings in the front plate, a puller plate in said chamber displaceable axially of said body, means for axially displacing the puller plate, said puller plate having a plurality of openings therein registering circumferentially with the openings in the front plate and with the inner ends of the jaw rods, and a plurality of individual couplings each slideably connected at one end with the inner end of a jaw rod and at its other end slideably connected with the puller plate to cause the outer ends of the jaws to shift radially in response to axial displacement of the puller plate, each coupling extending through an associated one of said openings in the puller plate and being connected with the puller plate at said last-mentioned opening, the puller plate openings having a radial extent sufficient to accommodate connection with the coupling for each of said radially adjusted positions of the support blocks.

4,570,950

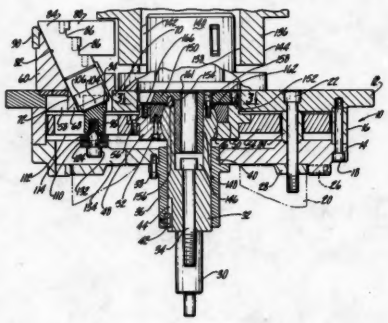
COMPENSATING CHUCK

Longine V. Morawski, and Lawrence V. Morawski, both of P.O. Box 631, Roseville, Mich. 48066

Filed Jun. 27, 1984, Ser. No. 624,920

Int. Cl.[4] B23B *31/16*

U.S. Cl. 279—1 J **6 Claims**



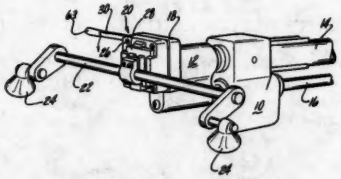
1. A chuck adapted to be mounted on a spindle of a machine tool for rotatably supporting a workpiece, comprising: a chuck body having a central axis and means for mounting the body coaxially on the spindle, a plurality of jaw rods mounted on the chuck body in circumferentially spaced relation for sliding movement along axes similarly inclined at an acute angle to the central axis of the body, a plurality of jaws mounted on outer ends of the rods, axially inner ends of the rods extending into said body, a jaw actuator in the body arranged for axial movement along the central axis of the body, a puller plate in the body extending generally transversely of the central axis of the body and connected at a central portion thereof with said jaw actuator, means connecting the axially inner end of each jaw rod with said puller plate so that the outer ends of the jaws are displaced radially in response to axial displacement of the puller plate, a swivel connection between the puller plate and the jaw actuator enabling the puller plate to swivel relative to the jaw actuator, a swivel connection between each jaw rod and the puller plate enabling the puller plate to swivel relative to the jaw rod, whereby, when the actuator is displaced in a direction to cause the jaws to shift radially, after a first jaw engages the workpiece, continued displacement of the actuator in said direction causes the puller plate to swivel on the actuator and also relative to said one jaw until the other jaws engage the workpiece, said chuck including a rigid lock out member constrained to move axially in said body with said actuator, said lock out member comprising a lock out plate extending radially across a forward end of the actuator and at least said central portion of the puller plate, said lock out plate having a first set of circumferentially spaced holes therethrough adapted to register with threaded openings in the actuator for receiving a first set of screws to clamp the lock out plate to the actuator, said lock out plate having a second set of circumferentially spaced holes therethrough adapted to register with threaded openings in the puller plate for receiving a second set of screws to clamp the lock out plate to the puller plate and thereby prevent swiveling movement of the puller plate.

4,570,951

QUICK CHANGE ADAPTER

Al L. Valentine, 21658 Summerdale, Southfield, Mich. 48034

Continuation of Ser. No. 399,618, Jul. 19, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,984
Int. Cl.[4] B23Q 3/00
U.S. Cl. 279—1 R 11 Claims



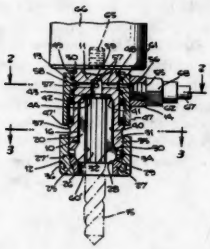
1. A releasable coupling comprising:
a mounting plate;
a tool holder secured to the front face of said mounting plate and adapted to releasably grasp a tool therein to secure the tool to the front face of said mounting plate;
a holding fixture defining a vertically extending slot at its front face generally conforming in size and configuration to said mounting plate for slidably and snugly receiving said mounting plate therein with the rear face of the mounting plate juxtaposed to and sliding on the front face of the holding fixure;
means on said holding fixture for releasably securing the rear face of said fixture to a support member;
a stop on said holding fixture adjacent the bottom of said slot including surface areas for engaging the bottom edge of said mounting plate as the latter arrives at the bottom of said slot and thereby support substantially all of the weight of said mounting plate and associated tool; and
locking means on said holding fixture for releasably engaging the top edge of said mounting plate with the bottom edge of said mounting plate engaging said stop to preclude withdrawal of said mounting plate from said slot.

4,570,952

FLUID COLLET CHUCK

Thomas Heimbigner, 9488 Vanruiten, Bellflower, 90706, and Phillip Stranahan, 2146 Country Club Dr., Glendora, both of Calif. 91740

Filed May 25, 1984, Ser. No. 614,068
Int. Cl.[4] B23B 31/30
U.S. Cl. 279—20 11 Claims



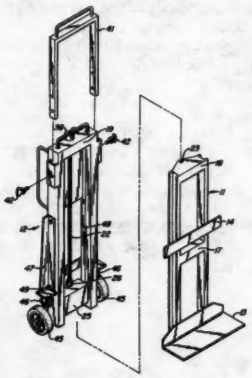
1. A chuck device for a drill having a working end and at the other end a retention shank, said chuck device being adapted to supply fluid to the interface of the working end with a workpiece and comprising a collet having a bore therein for retention of the shank of the drill, a conduit between inner and outer ends of said collet, a rotatable holder assembly for retention of the collet having a recess with an opening at one end for reception of the collet, the other end of said holder assembly being adapted for mounting on a rotating power device, a relatively stationary sleeve having an axially disposed chamber, said holder assembly having a rotatable mounting in said chamber, and a passage system between said sleeve and said conduit for passing fluid from a source exterior with respect to the sleeve to said conduit during rotation of the holder assembly while work is performed on said workpiece.

4,570,953

STAIR-CLIMBING HAND TRUCK

Ercel W. McPeak; Theodore Felzer, both of Appleton, Wis., and Frederick J. Rodgers, San Jose, Calif., assignors to Ultra Lift Corporation, San Jose, Calif.

Filed Mar. 1, 1983, Ser. No. 471,109
Int. Cl.[4] B62B 5/02
U.S. Cl. 280—5.3 4 Claims



1. A hand truck for powered raising and lowering of a heavy load comprising:
first and second aluminum frame members formed in a unitary construction of extruded aluminum and mounted for relative longitudinal reciprocating movement between two stop points, said first member having a lip attached thereto for positioning a load thereon;
actuation means coupled to said frame members for actuating relative longitudinal movement thereof, said actuation means being powered by a selectively engageable electric motor;
overload release clutch means coupling said motor and said actuation means for raising and lowering a load positioned by said lift on said frame members, said overload release clutch means decoupling said motor and said actuation means whenever said load exceeds a predetermined amount of at least about 1000 pounds and also whenever said frame members reach said stop points; and
said an audible warning sound whenever said load exceeds said predetermined amount and whenever said frame members reach said stop points.

4,570,954

LOAD CARRIER FRAME

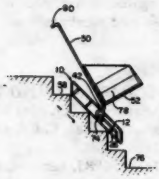
Daniel Mintz, 70 Cambridge Pl., Brooklyn, N.Y. 11238

Filed Dec. 31, 1984, Ser. No. 687,854
Int. Cl.[4] B62B 5/02
U.S. Cl. 280—5.24 13 Claims

1. A load carrier frame for moving a vehicle having an axle and wheels over a surface and up and down a flight of stairs comprising

a left rail and a right rail, the left and right rails being interconnected by a plurality of transverse spacers,

each rail comprising a bottom terminus, a top terminus, a bottom slide for slidingly contacting the stairs, and a vehicle axle track above a bottom slide,



the axle tracks being at least partly non-linear in configuration, the axle tracks beginning at a bottom terminus and ending medially of the left and right rails,

the axle tracks being adapted to permit movement of a wheeled vehicle relative to the load carrier frame by retaining portions of the vehicle axle therein in movable engagement.

4,570,955

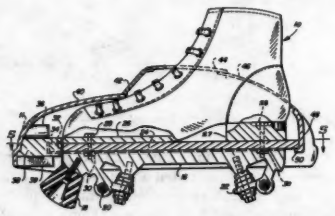
ROLLER SKATE ASSEMBLY WITH AN INTERCHANGEABLE BODY

David H. Winkler, and Donna K. Winkler, both of 2316 N. 29th Pl., Phoenix, Ariz. 85008

Filed Dec. 23, 1983, Ser. No. 565,009

Int. Cl.[4] A63C *17/02, 17/14*

U.S. Cl. 280—11.2 **6 Claims**



1. A roller skate assembly having a roller skate, a roller skate boot, and an interchangeable body which may be operably secured to and removed from said roller skate comprising, in combination:

a generally rectangular shaped plate, having tapered corners at its rear end, a plurality of pins attached to the front end of said plate, and having a plurality of elongated apertures passing therethrough, operably disposed between said roller skate and said roller skate boot;

a plurality of aligned elongated aperatures passing through each of said roller skate, said roller skate boot, and said plate;

a plurality of attachment means which cooperate with said plurality of aligned elongated aperatures for removably coupling said roller skate boot, said plate, and said roller skate;

an interchangeable body for said roller skate assembly, said interchangeable body further comprising:

a shell structure, said shell structure further having a plurality of openings therein;

fastening means attached to the front end of said interchangeable body for removably coupling to said pins of said plate and

a protruding member having a lip, attached to a rear inner surface of said interchangeable body, for removably coupling said interchangeable body to a rear end of said plate; and

roller skate wheels operably secured to said roller skate.

4,570,956

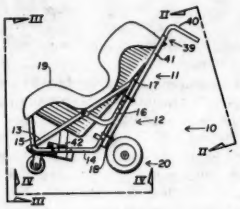
APPARATUS FOR CONVERTING A CAR SEAT TO A STROLLER

Gloria Dyer, 6507 Milam Way, North Higlands, Calif. 95660

Filed Sep. 17, 1984, Ser. No. 651,177

Int. Cl.[4] B62B *1/04*

U.S. Cl. 280—30 **1 Claim**



1. A child's car seat and apparatus for converting the car seat to a stroller comprising, in combination:

a car seat having a back portion, a seat portion, and framework for supporting the seat, said framework including a pair of tubular side portions having longitudinally extending, ground engaging support members and tubular rear portions extending upwardly along the back portion of the car seat;

a handle removably received within each of said tubular rear portions;

a rear wheel assembly including an axle, a wheel mounted on each end of the axle, and means for removably securing the axle to the framework; and

a front wheel assembly including an elongated bar of rectangular cross-section having a longitudinally extending cavity formed at each end thereof for receiving one of said ground engaging support members, within each cavity, clamp means for releasably securing a ground engaging support member within each cavity, a pair of caster wheel assemblies, each wheel assembly having a block portion with a pin extending rearwardly therefrom and a vertically extending plate mounted on the top of said block portion, said plate having a hinged portion with a slot therein, a pair of apertures located on the front surface of said elongated bar for receiving said rearwardly extending pins, and a twistable key mounted on the upper surface of said elongated bar adjacent each said aperture, said twistable key being adapted to be received in the slot of said hinged portion for releasably securing each said caster wheel assembly to said elongated bar.

4,570,957

MECHANIC'S CREEPER

James W. Rose, 127 Shoshone, Nampa, Id. 83651

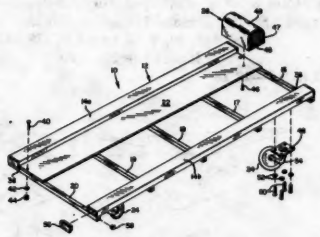
Filed Dec. 10, 1984, Ser. No. 679,808

Int. Cl.[4] B62B *11/00*

U.S. Cl. 280—32.6 **8 Claims**

1. A frame for a mechanic's creeper comprising:

a pair of longitudinal rails, said rails being upwardly arched from end-to-end; and



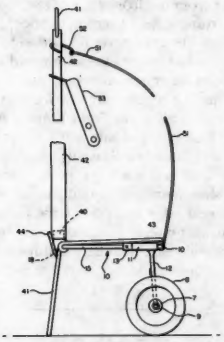
a plurality of cross members fastened to said longitudinal rails and extending between said rails for orienting the rails opposite each other in similar bowed relation.

4,570,958

CARRIER FOR SUITCASES, LUGGAGE, GARMENT BAGS, AND THE LIKE

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Jun. 13, 1984, Ser. No. 620,060
Int. Cl.[4] B62B *1/12*
U.S. Cl. 280—40 **3 Claims**



1. A wheeled carrier for articles such as suitcases, garment bags, luggage, and other articles comprising:

a frame of substantially rectangular shape having two longitudinal members and at least two side members;

wheel supports swingably secured to said side members of said frame by an aperture formed on the end of said wheel support which allows the wheel support to pivot about the frame on which it is secured;

wheels rotatably secured to said wheel supports;

said wheel supports adapted to be swung so that said wheels may be selectively positioned in an inactive position, where said wheels are substantially planar with said frame and an active wheeling position, where said wheels are substantially perpendicular to and below said frame and parallel to each other wheel;

said frame adapted to engage a generally downwardly facing side of said article;

an elongated member removably attached to said other longitudinal member of said frame;

said elongated member adapted to being used for pulling said frame when said wheels are in the active wheeling position;

means for providing a stable base for said frame when said wheels are in their active wheeling position;

coil spring means carried by one of said longitudinal members of said frame;

linkages connecting said spring means and said wheel supports such that the action of said spring means is transmitted to said wheel supports to urge and hold said wheel supports in the active wheeling position;

stops to prevent movement of said linkages along said one longitudinal member of said frame;

means for securing said article and frame together for movement as a unit on said wheels;

a U-shaped member swingably mounted to the frame which provides lateral support to articles carried by said frame especially when in the active wheeling position; and wherein each wheel when in the active wheeling position is located substantially below one of the ends of the longitudinal member of said frame; and

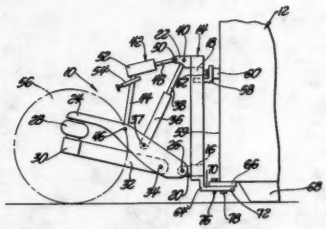
means for providing a stable base when said wheels are in the active wheeling position including the wheels and a member swingably supported on the other of the longitudinal members of said frame such that said swingable member can be moved from its active to inactive positions independent of the position of said wheels said swingable member being substantially U-shaped and including a stop when the U-shaped leg member is located in its active position below said frame.

4,570,959

DOLLY UNIT

Israel M. Grinwald, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1984, Ser. No. 650,013
Int. Cl.[4] B60P *3/40*
U.S. Cl. 280—43.23 **2 Claims**



1. An attachable system for moving rigid shelters and the like comprising: a plurality of edge brackets fixed to an edge of the shelter, each of said edge brackets including a plate rigidly attached to the shelter with an extension portion extending outward from the shelter, the extensions having an aperture and an aligning stud extending vertically from the plate; a complimentary plurality of supporting elements each having a bifurcated portion adapted to engage a corresponding aligning stud and a fastener aperture located in said elements so that when said aligning stud is positioned at the root of said bifurcated portion and the supporting elements and edge brackets are axially aligned, the apertures and fastener apertures are aligned; a plurality of fastening members disposed within the apertures and fastening apertures to firmly bind the edge brackets and supporting elements together; a support frame having a lower supporting bar with its longitudinal axis disposed horizontally and parallel to the side of the shelter to which the edge brackets are attached and at least one attachment pintle extending outward from the supporting bar on the side away from a plurality of vertical standards having their lower ends attached to the supporting bar and their upper ends located at a position above the midpoint of the shelter, an

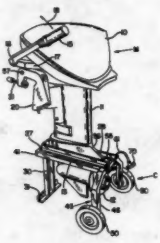
L-shaped bracket attached to the upper end of said vertical standards with one leg disposed parallel to the side of shelter said leg having an attaching aperture, and an attachment bracket attached to the uppermost end of said standards and extending outward from said standards away from said shelter; an attaching boss extending outward from said shelter to a point juxtaposed the leg; a plurality of attaching fasteners disposed in said leg and said boss to consolidate the leg and boss; a plurality of attaching fasteners disposed in said leg and said boss to consolidate the leg and boss; a shaped arm having an attachment end journaled to the attachment pintle and having an axle end disposed at a distance from said attachment end and located so it is vertically disposed above the attachment end; an axle adapted to be attached to a source of power; a flexible attachment means connecting the axle end of said shaped arm at a relatively constant distance from the surface of the axle; a tie rod having one end rigidly affixed to the axle and the other end journaled to the shaped arm at a point between the attachment location of the shaped arm to the attachment boss and the attachment location of the flexible attachment means, said tie bar being positioned so that it is in an essentially horizontal position when the shelter is in a position for transportation; an articulated arm which can be folded when the support frame is lowered to an engaging position where the supporting elements are below the edge brackets and straightened for securing the support frame in a supporting position for lifting said shelter the articulated arm having one end attached to the midportion of the shaped arm and the other end fastened to the attachment bracket; and clamping means adapted to hold the articulating joint of the articulated arm when the shelter is in the transportation position and to allow movement of the joint when the shelter is to be loaded or unloaded.

4,570,960

OUTBOARD MOTOR CART

William F. Peetz, 301 W. 20th, The Dalles, Oreg. 97058

Filed Apr. 16, 1984, Ser. No. 601,068
Int. Cl.[4] B62B *1/26*
U.S. Cl. 280—47.13 R **5 Claims**



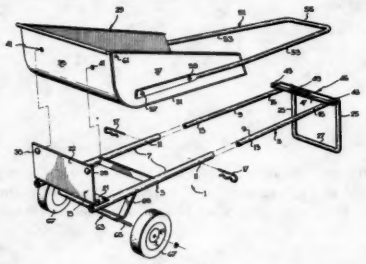
1. A cart for moving and storing marine outboard motors of the type having a vertical stem with a motor on the upper end of the stem and a propeller and horizontal cavitation plate on the lower end of the stem, comprising a pair of horizontal rails engageable with one face of said cavitation plate on opposite sides of said stem, means engageable with the opposite face of said cavitation plate to clamp said cavitation plate against said rails, a support leg at one end of said rails, a pair of support legs at the opposite end of said rails and wheels on said pair of legs, said first leg being a front leg and said pair of legs being rear legs, said pair of rear legs and said wheels being disposed on opposite lateral sides of said propeller, said pair of rear legs assuming the shape of an arch around the top and sides of the propeller, said clamping means comprising a second pair of rails on opposite sides of said stem parallel with said first rails, said first pair of rails being integral with said front leg and engaging the top face of said cavitation plate said second pair of rails being integral with said rear legs and engaging the bottom face of said cavitation plate.

4,570,961

MULTI PURPOSE TRANSPORT CART

Robert Chateauneuf, 534 Mercier, St. Jean sur Richelieu, Québec, Canada (J3B 6J6), and Guy Chateauneuf, 465 Mgr Langis, Apt. 705, Rimouski, Quebec, Canada

Filed Apr. 30, 1985, Ser. No. 728,930
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—47.18 **10 Claims**



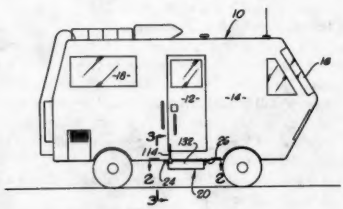
1. A transport cart comprising: a chassis having a forward wheel-mounted end part and a rearward wheelless end part, each part including a pair of side members with the side members of one pair being telescopically slidable in the side members of the other pair whereby selectively to adjust the length of said chassis and means releasably locking said side members in one of at least two selectible lengths; a load-abutment member upstanding from the front ends of said side members of said forward part, transversely thereof; support leg means projecting down from the rear ends of said side members of said rearward part; a barrow mounted on said side members and against said load-abutment member, said barrow including a bottom wall having a rear edge, a forward wall upstanding from said bottom wall at the front thereof and butting against said abutment member, and side walls joining said bottom wall and forward wall; means releasably interconnecting said barrow forward wall and load-abutment member; and locking clips on said side members of said chassis rearward end part engaging said rear edge of said barrow bottom wall for holding, along with said interconnecting means, said barrow releasably secured to said side members and for freeing said barrow when said telescoping side members are moved away from one another.

4,570,962

RETRACTABLE VEHICLE STEP ASSEMBLY

Salvador V. Chavira, 1330 N. Alma Ave., Los Angeles, Calif. 90063

Filed Jan. 16, 1984, Ser. No. 570,956
Int. Cl.[4] B60R *3/02*
U.S. Cl. 280—166 **6 Claims**



1. A retractable vehicle step assembly particularly suited for recreational vehicles and adapted to be secured to the underframe of said vehicle immediately below an access door to said

vehicle, wherein said step can be moved from a retracted position to an extended usable position when said door is open comprising:

a frame means, secured to the underframe of said vehicle below said access door;

a step pivotally mounted on said frame and moveable from a first retracted position under said vehicle to a second extended cantilevered position projecting outwardly of said frame and said step having a rearward extension member integral therewith so that when said step is in said second position said rearward extension member may bear against said frame when weight is placed on said step to reduce the bending moment of said step when entering or leaving said vehicle;

pivot means rotatably mounted in said frame for free rotation therein and permanently affixed to said step so that said pivot means and said step move simultaneously; and

linkage means including a horizontal fixed sleeve coupled to said vehicle door, a telescoping bar slidably mounted in said horizontal fixed sleeve extending to and connected to said pivot means, cap means mounted atop said pivot means to direct rotation of said pivot means and said step and a lock pin in said cap means bistable against said telescoping bar to cause said pivot means to rotate with the movement of said fixed sleeve and said telescoping bar whereby movement of said door will be translated to said step to move between said first and second positions.

4,570,963

FRONT WHEEL SHOCK ABSORBING SYSTEM FOR MOTORCYCLES

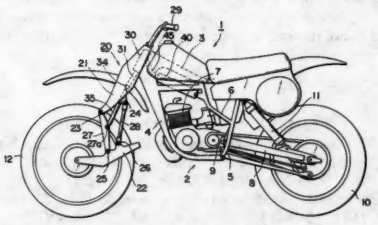
Tokio Isono, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,108

Claims priority, application Japan, Dec. 15, 1982, 57-219483; Dec. 15, 1982, 57-219484

Int. Cl.⁴ B62K *25/04*

U.S. Cl. 280—277 **4 Claims**



1. A front wheel shock absorbing system in a motorcycle having a body frame, a head pipe secured to a front end of said body frame, a front wheel and a front wheel suspension mechanism for supporting said front wheel, said front wheel suspension mechanism including at least one motion member adapted to move in accordance with up and down movements of said front wheel, said front wheel shock absorbing system comprising:

said head pipe constituting a hydraulic cylinder;

a force transmitting member having one end connected to said motion member for transmitting an external force applied to said front wheel;

a bearing head positioned in the transverse direction of the vehicle body and connected to said force transmitting member;

a slide member having one end connected rotatably to a substantially central portion of said bearing head so that the bearing head is rotatable about the axis of the slide member, said slide member being inserted into said hydraulic cylinder slidably in the axial direction of said head pipe so that its upper end is present within the cylinder, said upper end being provided with a piston adapted to slide within the cylinder; and

a damper mounted on said body frame of said motorcycle and operatively connected with said slide member, said damper comprising a cylinder, a piston slidably fitted in said cylinder to partition the interior of said cylinder into an oil chamber and an air chamber, and a spring disposed within said air chamber for urging said piston, said head pipe being connected to said oil chamber of said damper hydraulically through an oil path means which includes a damping force generating valve.

4,570,964

ELASTIC SELF CARRYING BELLOWS

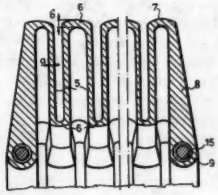
Ilona Tatay; Gusztáv Gündisch; Jeno Mádi; László Palotás, and Gyula Subotics, all of Budapest, Hungary, assignors to Taurus Gumiipari Vállalat, Hungary

Filed Jun. 8, 1983, Ser. No. 502,161

Claims priority, application Hungary, Jul. 8, 1982, 2227/82

Int. Cl.⁴ B06D *5/00*

U.S. Cl. 280—403 **10 Claims**



1. An elastic self-carrying bellow-body in particular for articulated wheeled vehicles for connecting one part of such vehicle to another part of that vehicle and permitting those vehicle parts to move with respect to each other, the bellow-body having an upper arch, a transverse axis, two side walls and a lower arch with the upper and lower arches being similar to each other and the two side walls being similar to each other, said bellow-body having a longitudinal axis and ends each of which is adapted to be connected to a portion of a vehicle body to couple vehicle body portions together, characterized in that said bellow-body side walls and arches include a multiplicity of ribs which are spaced apart along the longitudinal axis of the bellow-body each of said ribs having a thickness dimension and interconnecting means connecting adjacent ribs of said multiplicity of ribs, said interconnecting means being monolithic with said adjacent ribs so that said bellow body is monolithic and having a thickness dimension less than said rib thickness dimension whereby bending stresses arising from opening and closing of the bellow-body are principally taken up by said interconnecting means so the bellow-body is very expandable and contractable.

4,570,965

VEHICLE STEERING MECHANISMS

Kennith Caswell, Merthyr Tydfil, England, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB83/00036, § 371 Date Oct. 11, 1983, § 102(e) Date Oct. 11, 1983, PCT Pub. No. WO83/02758, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 9, 1983, Ser. No. 556,238

Claims priority, application United Kingdom, Feb. 10, 1982, 8203851

Int. Cl.⁴ B62D *13/02*

U.S. Cl. 280—426 **19 Claims**

1. A steering mechanism for a long vehicle having leading and trailing ends and comprising:

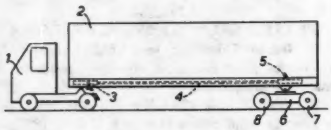
a first steering device located towards the leading end,

a steering member located towards the trailing end and so

controlled by a second steering device located towards the trailing end that the steering member will act in a steering mode in which it positively steers that end of the vehicle or in a following mode in which it follows an existing direction of motion which is in a straight line or follows an arc of constant radius;

a linkage between the first and second steering devices;

actuating means within that linkage, and responsive both to a first angle which the first device makes with the fore-and-aft centreline of the vehicle and a second angle which the second device makes the same line;



said actuating means operating to cause the second device to lock the steering member in its following mode whenever the second angle is less than a predetermined function of the first angle, but operating under other conditions to cause the second device to make the steering member operate in its steering mode in a manner which tends to make the second device progress to a condition wherein equality between the second angle and that function of the first angle is achieved.

4,570,966

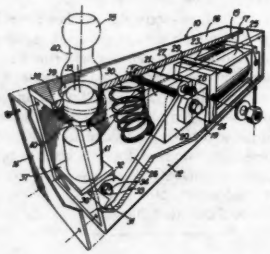
RETRACTABLE TRAILER HITCH BALL

George W. Giboney, Rte. 1, Hallsville, Md. 65255; Robert E. Vanlandingham, 819 Crestland, Columbia, Mo. 65203, and James L. Grimshaw, Rte. 7, Box 10, Columbia, Mo. 65202

Filed Apr. 9, 1985, Ser. No. 721,374

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—433 **12 Claims**



1. A retractable hitch ball assembly comprising a housing adapted to be fixed to the bottom side of a truck bed adjacent to a hitch ball clearance opening in such bed, an elevator plate for a hitch ball pivotally mounted for vertical swinging movement in said housing, a hitch ball having a lost motion pivotal connection with the elevator plate in said housing and extending above the elevator plate, the housing having a hitch ball clearance opening formed in its top wall through which the hitch ball can be extended or retracted by the swinging movement of the elevator plate, and a remotely operated linear actuator means in said housing including a cam-like elevating and load bearing block element adapted to slide under the elevator plate and traverse the elevator plate in opposite directions to raise and lower the elevator plate with said hitch ball.

4,570,967

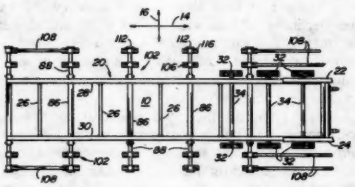
EXTENDIBLE TRAILER SYSTEM

Fred Allnutt, 10370 Baltimore-National Pike, Ellicott City, Md. 21043

Filed Nov. 25, 1983, Ser. No. 555,146

Int. Cl.[4] B62D *21/14*

U.S. Cl. 280—656 **17 Claims**



1. An extendible trailer system adapted to be coupled to a cab of a vehicle comprising:

(a) a longitudinally extended first trailer frame including at least a pair of transversely displaced longitudinally extending channel members;

(b) a longitudinally extended second trailer frame adapted to be coupled to said first trailer frame, said second trailer frame including at least a pair of transversely displaced longitudinally extending beam members; and,

(c) means for releasably coupling said second trailer frame to said first trailer frame, said second trailer frame being at least partially slidably inserted into coupling relation with said first trailer frame, said means for releasably coupling including a transversely directed rear beam member and a transversely directed frontal beam member rigidly secured to said pair of transversely displaced longitudinally extending channel and beam members of said first and second trailer frames respectively, said means for releasably coupling further including insert coupling means for releasably securing said rear beam member to said frontal beam member and hasp means for maintaining said insert coupling means in secured relation to said rear beam member and frontal beam member.

4,570,968

VEHICLE SUSPENSION SYSTEM

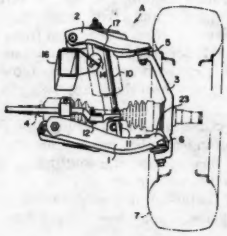
Yoshiaki Mukai, and Iwao Ueno, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 30, 1983, Ser. No. 556,541

Claims priority, application Japan, Dec. 6, 1982, 57-213771; Dec. 6, 1982, 57-184583[U]; Dec. 8, 1982, 57-186544[U]

Int. Cl.[4] B62D *9/02*

U.S. Cl. 280—664 **7 Claims**



1. A vehicle suspension system including an A-type suspension lower arm having a front mounting portion pivotally attached to the body of a vehicle, a rear mounting portion pivotally attached to the vehicle body, and a ball-joint mounting portion disposed between said front and rear mounting

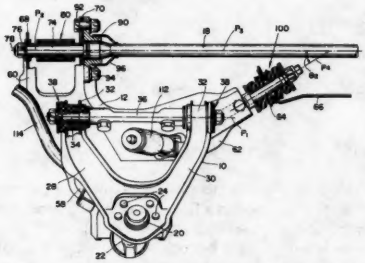
portions, said suspension lower arm being adapted to be swung in the vertical direction around said front and rear mounting portions, said suspension lower arm comprising a first arm member and a second arm member respectively formed by bending a plate material and having an upper wall, with a rear edge, and a pair of side walls on the opposite sides of said upper wall, said first and second arm members each having a pair of horizontal flanges respectively formed at the lower edges of their side walls, said first arm member extending rearwardly from said front mounting portion, said second arm member extending forwardly from said rear mounting portion and being superimposed on and secured as by welding to said first arm member at a location near said ball-joint mounting portion said extension of said first arm member being secured to the horizontal flanges at the lower edges of said opposite side walls of said second arm member so as to provide a closed cross-sectional structure.

4,570,969

TORSION BAR SUSPENSION FOR AN AUTOMOTIVE VEHICLE

Takashi Tsutsumi, Fujisawa, and Shuji Matsumoto, Atsugi, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 3, 1984, Ser. No. 567,904
Int. Cl.[4] B60G *11/20*
U.S. Cl. 280—664 **17 Claims**



1. A torsion bar suspension for an automotive vehicle comprising:

a suspension arm rotatably supporting a vehicle wheel at the outer end thereof and having a first front leg portion and a second rear leg portion;

a first bracket secured to the vehicle body and pivotably securing said first leg of said suspension arm to the vehicle body;

a torsion bar mounted on the vehicle body via said first bracket, connected at one end to said first leg of said suspension arm and extending essentially along the longitudinal vehicle axis, the other end thereof being secured to the vehicle body;

a second bracket secured to the vehicle body independently of said torsion bar and pivotably connecting said rear leg of said suspension arm onto said vehicle body, said second bracket being located at a position transversely and axially away from the position of said first bracket; and

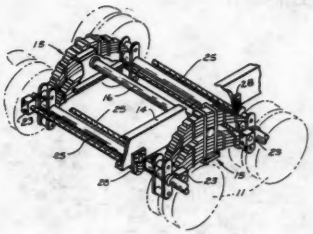
a compression rod interposed between said second leg of said suspension arm and said second bracket so as to be connected to said second bracket rearward of the rear end of said second leg.

4,570,970

MULTIPLE AXLE STABILIZING SYSTEM

George Burfiend, Box 6071, Spokane, Wash. 99207

Filed Sep. 27, 1984, Ser. No. 655,070
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—680 **4 Claims**



1. A stabilizing system for a wheeled vehicle having a longitudinal frame and multiple wheels rotatable about parallel transverse axles at opposite sides of the longitudinal frame, the stabilizing system comprising:

axle brackets rigidly mountable to the axles adjacent the wheels mounted thereon;

nonextensible, flexible cable-like connectors each having one end attached to an axle bracket and extending to a remaining end; and

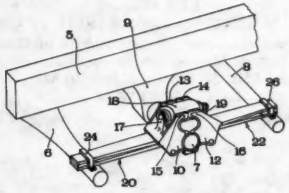
frame brackets mountable to the vehicle frame on opposite sides thereof and mounting the remaining ends of connectors such that horizontal angular motion of the axles relative to the vehicle frame will be resisted by the connectors.

4,570,971

MOTOR VEHICLE SUSPENSION

Roberto Perlini, 37047 San Bonifacio-Locara, Italy

Filed Mar. 22, 1984, Ser. No. 592,372
Claims priority, application Italy, Jan. 16, 1984, 67038 A/84
Int. Cl.[4] B60G *5/00*
U.S. Cl. 280—680 **6 Claims**



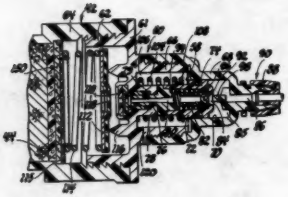
1. A motor vehicle suspension having plural resilient elements having different degrees of resiliency, comprising for each side of the motor vehicle a first center resilient means acted upon by a pair of control arms provided with articulated heads supported by a pair of elements rotatably coupled to a center pin on the chassis of the motor vehicle, characterized by second resilient means having a degree of resiliency lower than that of said first resilient means, said second resilient means being formed of a pair of springs supported laterally by said rotatably coupled elements, the ends of said springs being supported by unsprung members of the motor vehicle.

4,570,972

PRESSURE CONTROL VALVING FOR PNEUMATIC LEVELING SYSTEMS

William Pangos, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1984, Ser. No. 606,240
Int. Cl.[4] B60G 11/26
U.S. Cl. 280—714 6 Claims



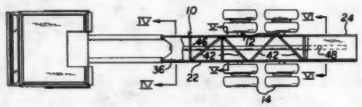
1. Pressure balancing valve assembly for a vehicle pneumatic leveling system comprising a compressor for supplying pressurized air to an air adjustable suspension unit operatively mounted between sprung and unsprung masses of a vehicle, an air dryer unit operatively interposed in a pneumatic connection between said compressor and said suspension unit, said air dryer unit comprising a housing with a dessicant therein for drying air flowing therethrough from said compressor to said suspension unit, a cover assembly for said air dryer unit formed with an air flow passage therethrough, a valve assembly operatively mounted in said air passage of said cover assembly, said valve assembly comprising piston means shiftably mounted in said air passage and valve element means mounted in said piston means and shiftable between a first and balanced position in which pressure in said suspension unit is a predetermined high pressure and there is no flow of air through said passage and a second position in which pressure in said suspension unit is less than said predetermined high pressure and pressurized air can flow through said passage to said suspension unit, and spring means in said housing for moving said valve element means from said first to said second position in response to the drop in pressure in said suspension unit or by the supply of a pressure beyond a predetermined pressure by said compressor for effecting the unseating of said piston means and the exhaust of air from said system until a predetermined balance is obtained.

4,570,973

FIRE TRUCK TORQUE BOX AERIAL FRAME

Ronald L. Ewers, and Bruce C. Barton, both of Ocala, Fla., assignors to Federal Motors, Inc., Oscia, Fla.

Filed Mar. 21, 1984, Ser. No. 591,829
Int. Cl.[4] B62D 21/00
U.S. Cl. 280—800 2 Claims



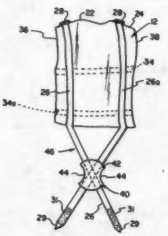
1. A vehicle frame characterized by its ability to resist torque forces and particularly suited for supporting aerial apparatus comprising, in combination, an elongated body having front and rear ends, an upper portion, lateral sides, and a bottom portion, said body having a box transverse cross section whereby said upper and bottom portions are riddidly affixed to said lateral sides, said bottom portion being concave and extending toward said upper portion, said body lateral sides comprising channel beams each having a base and top and bottom legs extending in a common direction from said base inwardly toward said other lateral side, an upper plate extending between said channels' top legs and affixed to the upper side thereof comprising said body upper portion, a plurality of shaped concave plates extending between said channels' bottom legs and affixed thereto defining said body bottom portion, said concave plates including flanges engaging and affixed to the underside of said channels' bottom and a central concave portion extending upwardly toward said body upper portion, and a plurality of reinforcing plates within said body diagonally extending transversely across said body having ends affixed to said channel beams, said reinforcing plates being of a vertical dimension substantially equal to the vertical dimension of said body at the location of said reinforcing plate, said plates having a lower concave edge conforming to the configuration of said bottom portion plates.

4,570,974

SAFETY VEST

Arthur Dove, 40 Samoset St., Weymouth, Mass. 02190

Filed Apr. 30, 1984, Ser. No. 605,195
Int. Cl.[4] B62B 35/00
U.S. Cl. 280—801 12 Claims

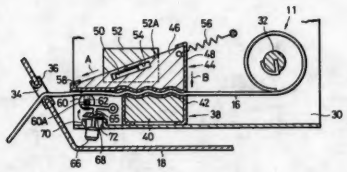


1. A safety vest which permits safe standing in a moving vehicle, the vest comprising a front panel, a back panel, a right shoulder portion, a left shoulder portion and a crotch pad, the front panel having a right bottom portion and a left bottom portion, the back panel having a first side and a second side, the second side spaced from the first side, the right shoulder portion and the left shoulder portion spaced from each other and both associated with the back panel and with the front panel, the first and second sides of the back panel associated with the front panel, first attachment means associated with the right shoulder portion, second attachment means associated with the left shoulder portion and the crotch pad associated with the back panel and having means for association with the front panel whereby at least one line extending from a reel engaged with the roof of the vehicle is adapted to engage the first attachment means, the first and second attachment means being D rings and the back panel has a first bottom portion and a second bottom portion, a first strap extension extending from the first bottom portion and a second strap extension extending from the second bottom portion, the front panel having a right bottom portion and a left bottom portion, the right bottom portion having a fifth attachment means associated therewith, the left bottom portion having a sixth attachment means associated therewith, the crotch pad adapted to engage the first and second strap extensions and the first strap extension means adapted to engage the fifth attachment means and the second strap extension adapted to engage the sixth attachment means.

4,570,975
WEBBING LOCKING DEVICE

Teruhiko Kawaguchi, and Yuji Nishimura, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Niwa, Japan

Filed Dec. 26, 1984, Ser. No. 686,395
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—806 **20 Claims**



1. A webbing locking device adapted for use in a seatbelt system for restraining an occupant of a vehicle by an occupant restraining webbing, which comprises:

(a) a frame fixed to a vehicle body;

(b) a fixed locking member fixed to the frame;

(c) a movable locking member supported movably by the frame to be opposed to the fixed locking member, the movable locking member locking an intermediate portion of the webbing by the same and the fixed locking member in an emergency situation of the vehicle;

(d) guide means for guiding the movable locking member in a direction of a webbing drawing-out and approach to the fixed locking member;

(e) trigger means supported by the frame movably in such a direction to cause the webbing to abut on a portion of the movable locking member; and

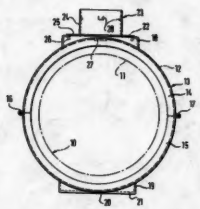
(f) acceleration sensing means for detecting a large acceleration to actuate the trigger means in the emergency situation of the vehicle,

whereby the webbing is locked by the fixed and the movable locking members in the emergency situation of the vehicle.

4,570,976
SLEEVE-SHAPED COUPLING FOR PIPELINES

Rolf Othold, Oldenburg, and Heinz Hetzenecker, Bad Zwischenahn, both of Fed. Rep. of Germany, assignors to Oltmans, Ziegel und Kunststoffe GmbH, Edewecht/Jeddeloh 1, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,968
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1983, 3235624
Int. Cl.[4] F16L *37/00*
U.S. Cl. 285—4 **10 Claims**

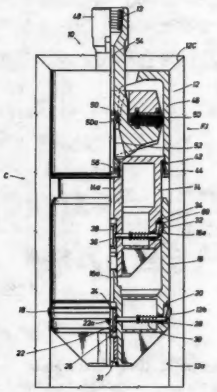


1. A sleeve-shaped coupling device for attachment of a branch pipe to a pipeline having a cylindrical outer wall, said coupling device being comprised of two coupling members sub-divided through the longitudinal center plane of said coupling device, with said two coupling members positioned circumferentially about and clamped in sealing contact against the cylindrical outer wall of the pipeline, with said coupling device having at least one radial extension shoulder thereon with said at least one radial extension shoulder including an end cover wall having a prescored break-off portion therein for providing an opening therein, with said coupling device further including a pipe fitting member portion comprised of a radial flange member and a pipe connection member for attachment of a branch pipe thereto, with said radial flange member formed integral to one end of said connection member and having at least one arresting member extending substantially perpendicular therefrom and axially positioned on said flange, such that upon engagement of said pipe fitting member portion to said radial extension shoulder of said coupling device, said at least one arresting member is engageable with said end cover wall surrounding said opening therein and said flange member is in contact against said end cover wall of said radial shoulder in sealing engagement thereto and the branch pipe is attached to said pipe connection member to complete the attachment of the branch pipe to the pipeline.

4,570,977
MECHANICAL CONNECTOR APPARATUS

James A. Burton, and Richard B. Lee, both of Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Jun. 17, 1983, Ser. No. 505,208
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—39 **10 Claims**



1. A connector apparatus adapted for releasably securing two separable force transmitting assemblies in a force transfer relationship, including:

a first connector assembly having a tubular member with an opening forming an inner surface, said inner surface having a recess formed therein for releasably receiving in securing engagement a second assembly;

a second connector assembly having a primary housing and a secondary housing, said primary housing mounted to and extending from said secondary housing;

a locking ring member movably mounted with said primary housing for movement to and from a radially contracted released position and a radially expanded locking position operably disposed within said recess of said tubular member for connecting said first connector assembly with said second connector assembly in force transmitting relationship;

a keeper mounted with said primary housing for maintaining said locking member with said primary housing when said locking member is in the released position;

means mounted with said primary housing for releasably

holding said locking ring member in the radially contracted released position by a predetermined mode of actuation to enable said primary housing to separate from said tubular member of said first connector assembly said means for releasably holding said locking ring member actuated after said locking ring member is moved from said recess to the released position by relative movement of said connector assemblies; and

means for releasably connecting said primary securing housing and said secondary securing housing for enabling separation and retrieval of said secondary housing should said locking member mounted with said primary securing housing fail to release from said recess of said first connector assembly.

4,570,978

ROTARY COUPLING FOR A PLURALITY OF INDEPENDENT FLUIDS

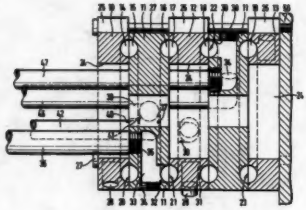
Hans F. Arendt, Industriestrasse 32, 7126 Sersheim, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,478

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217462

Int. Cl.⁴ B05B *3/02*

U.S. Cl. 285—131 **9 Claims**



1. Apparatus for transmitting liquid and/or gaseous fluids between two parts rotating relative to one another, comprising:

a first housing formed by a plurality of axially spaced apart disks of a first kind arranged coaxially about an axis and each having at least one face generally perpendicular to said axis;

a second housing formed of one or more disks of a second kind coaxial with said axis and having at least one face generally perpendicular to said axis for rotatably cooperating with said disks of the first kind along with their faces, defining therebetween a plurality of annular chambers coaxial with said axis;

a first coupling means for fluid transmission within the first housing for communication with each annular chamber and projecting radially outwards therefrom; and

second coupling means for fluid transmission in the second housing for communication with each annular chamber and projecting axially therefrom;

whereby fluid may be independently transmitted through the annular chamber to connect a first and second coupling means during the rotation of the first or second housings relative to one another.

4,570,979

FLEXIBLE JOINT MEANS

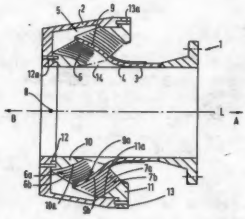
Alan F. Moore, Burbage, England, assignor to Dunlop Limited, London, England

Filed Jun. 1, 1983, Ser. No. 499,864

Claims priority, application United Kingdom, Jun. 10, 1982, 8216919

Int. Cl.⁴ F16L *27/10*

U.S. Cl. 285—223 **24 Claims**



1. Flexible joint means comprising a rigid outer member having an end portion defining an opening therein, first and second radially inwardly extending annular flanges associated with said outer member, said flanges being spaced relative to one another along the longitudinal axis of said joint means, a rigid inner member having an end portion positioned within said opening in said outer member, a radially outwardly extending annular collar associated with said inner member, said collar being positioned between said first and second flanges, a first annular elastomeric bearing acting between a radially outwardly facing surface of said first flange and a radially inwardly facing surface of said collar, a second annular elastomeric bearing acting between a radially outwardly facing surface of said collar and a radially inwardly facing surface of said second flange such that said first bearing is positioned radially inwards of said second bearing and said first and second bearings are constructed to have substantially similar axial stiffnesses, and said elastomeric material of said first bearing has a higher modulus of elasticity than said elastomeric material of said second, radially outer, bearing.

4,570,980

STAPLE COUPLING

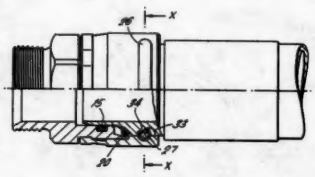
Stanley H. Goward, Salisbury, United Kingdom, assignor to BTR plc, London, United Kingdom

Filed Jun. 3, 1983, Ser. No. 500,882

Claims priority, application United Kingdom, Jun. 7, 1982, 8216506

Int. Cl.⁴ F16L *37/00*

U.S. Cl. 285—305 **10 Claims**



1. In a releasable fluid coupling which includes interengageable male and female members, said male member having an outer surface with a groove therein and said female member having an inner surface with a groove therein, said grooves being aligned when said male and female members are fully engaged together, said female member including holes extend-

ing therethrough which are aligned with the groove on the inner surface thereof; a sealing means for providing a fluid-tight connection between said male and female members; and a generally U-shaped staple having legs, the legs of said generally U-shaped staple being insertable through the holes in said female member and along the aligned grooves in the outer and inner surfaces of said male and female members when said male and female members are fully engaged together to keep said male and female members from becoming fully separated,

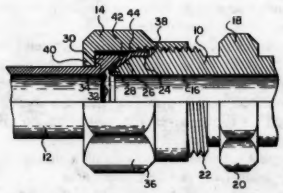
the improvement wherein said releasable fluid coupling includes a biasing means located between said male and female members to urge them apart and wherein the legs of said generally U-shaped staple have recesses therein, and wherein said male member has means cooperable with said recesses such that, after being inserted through said holes in said female member and along the aligned grooves in the outer and inner surfaces of said male and female members when said members are fully engaged together and once said biasing means has urged them apart, said generally U-shaped staple cannot be removed from between said male and female members.

4,570,981

ADAPTER SEAL

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Oct. 1, 1984, Ser. No. 656,273
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—332.3 **2 Claims**



1. An adapter seal for use with conduit fittings having a first part having a conical nose of given axial dimension, a second part having a recessed conical surface in axial alignment with the nose and complementary thereto, and connection means axially displacing the nose and conical surface toward each other, in combination, an annular metal seal having a substantially cylindrical circumferential portion, a cone portion depending from said circumferential portion having an axial dimension slightly less than the first part nose axial dimension and having inner and outer parallel sides defining the cone portion radial thickness and terminating in an inner end, and an annular elastomer seal of conical form bonded to said cone portion inner end constituting an extension of said seal cone portion and the conical configuration thereof whereby compression of said cone portion and elastomer seal between the fitting nose and conical surface establishes both a metal-to-metal seal and an elastomer seal.

4,570,982

TUBULAR JOINT WITH TRAPPED MID-JOINT METAL-TO-METAL SEAL

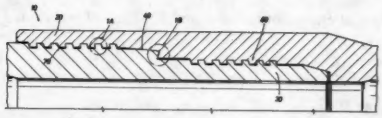
Thomas L. Blose, Houston, and K. Darrel Chelette, Katy, both of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Jan. 17, 1983, Ser. No. 458,733
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—334 **28 Claims**

28. A joint for tubular elements comprising,

an internally threaded female member and an externally threaded male member adapted to be threadably connected,

the threads of the female and male members having negative angle load flanks and having at least two radial steps axially separated from one another by a reverse angle torque shoulder having an adjacent conical sealing surface, said female member torque shoulder and said male member torque shoulder being in direct engagement upon make-up of the joint, said male member conical sealing surface adjacent said reverse angle torque shoulder being formed on a substantially solid, pipe wall uninterrupted from the interior of the male member to the sealing surface,



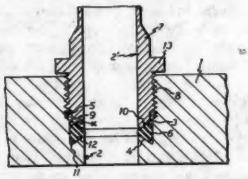
whereby said shoulders serve as a positive axial and radial assembly stop, said adjacent conical sealing surfaces develop radial positional interference when the male and female members are fully assembled as a result of the assembly of the sealing surfaces during joint make up and by the mating of the reverse angle torque shoulders, and whereby the negative load flank angle of the threads and the reverse angle torque shoulders combine to interlock the male and female members and to prevent differential radial separation of the engaged conical sealing surfaces when the joint is exposed to internal pressure, external pressure or both.

4,570,983

PIPE CONNECTION WITH A SEAL RING SATISFYING HYGIENIC DEMANDS

Lars Olenfalk, Järfälla, and Tor Delbou, Sollentuna, both of Sweden, assignors to Arla, Stockholm, Sweden

Filed Mar. 15, 1983, Ser. No. 475,681
Int. Cl.[3] F16L *21/02*
U.S. Cl. 285—355 **12 Claims**



1. Apparatus for providing a hygienic fluid passage, comprising a pipe member with a bore therethrough and with a cylindrical end portion, another member having a cylindrical bore that extends from an opening in a surface of said other member to an interior region of said other member, said cylindrical end portion of said pipe member fitting into said cylindrical bore through said opening, said other member having another bore connected to said cylindrical bore at said region and of cross-section smaller than that of said cylindrical bore, means for fastening said pipe member to said other member with said cylindrical end porton in said cylindrical bore, said bores of said other member being connected at said region by a transition including a shoulder extending outward from said other bore and opposed to an end surface of said pipe member and separated therefrom by a space, at least one of said end surface and said shoulder being inclined at an angle such that the separation between said end surface and said shoulder increases outwardly, an elastically deformable O-ring seal disposed in said space compressed between said end surface and said shoulder and substantially filling said space, said O-ring seal being formed of a material having a circular cross-sec-

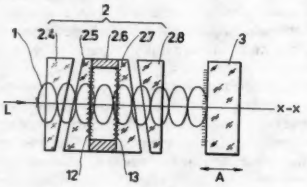
tion in axial planes of the O-ring seal, said material being deformed into a substantially triangular cross-section when said O-ring seal is compressed between said end surface and said shoulder, and means separate from said O-ring seal for limiting the insertion of said cylindrical end portion of said pipe member into said cylindrical bore to a position at which contact between said end surface and said shoulder is prevented, whereby the dimensions of said space between said end surface and said shoulder and the configuration of the compressed elastically deformable O-ring seal are predetermined to provide a continuous fluid passage comprising the bore of said pipe member, said other bore, and a portion of said O-ring seal.

4,570,984

DOOR HOLD

Norman Russ, Box 508, Norwich, Conn. 06360

Filed Aug. 15, 1983, Ser. No. 523,446
Int. Cl.⁴ E05C *9/02, 5/00*
U.S. Cl. 292—18 **1 Claim**



1. A door holder comprising a base adapted for attachment to a floor adjacent the path of movement for the door during door opening movement, a first lever pivotally received in said base for limited movement toward an extended position wherein a free end of the said lever serves to stop door opening movement beyond a predetermined door position, a spring to urge said first lever toward said extended position, a second lever movably mounted with respect to said base between an extended position wherein the door is trapped between it and said first lever and a retracted position wherein the door can move into said predetermined position past said second lever by camming said second lever toward said retracted position, said second lever also movable to a third position wherein the door can move toward its closed position and past said second lever, spring biasing means to urge said second lever toward said extended position, a common pivot post for both levers, said second lever having a slot defined therein for slidably receiving said pivot post and providing for slidable motion of said second lever relative said base in addition to the pivotal motion thereof relative said base, and said base having at least one stop to restrict said second lever to pivotal motion only between said first and second positions thereof.

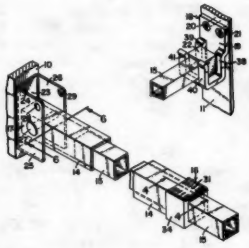
4,570,985

LOCKING APPARATUS FOR USE WITH A PANEL SLIDEABLE IN A PLANE

Russell W. Waldo, Mendota Heights, Minn.; Cardell E. Miller, Hudson, Wis.; Louis D. Huot, Vadnais Heights, and George L. Engstrom, Minneapolis, both of Minn., assignors to Ideal Security Hardward Corporation, St. Paul, Minn.

Filed Apr. 23, 1982, Ser. No. 371,309
Int. Cl.⁴ E05C *17/30*
U.S. Cl. 292—262 **6 Claims**

1. A lockable panel combination comprising:
(a) a pair of panels wherein one panel is fixed adjacent to a surface and the other panel is slideable in a plane adjacent and parallel to the fixed panel, the slideable panel being suitable for selectively and adjustably sliding in an open direction and a closed direction to provide a variable opening in the surface; and
(b) a locking apparatus comprising:
(i) a locking bar mechanism having an adjustable bar length comprising a first member; a second member slideably attached to the first member; and a locking mechanism at the point of attachment of the first and second members, the locking mechanism substantially preventing a decrease in the bar length unless the locking mechanism is activated, and the locking mechanism freely allowing an increase in the bar length;
(ii) first means for operatively connecting a remote end of the first member to the surface; and
(iii) second means for operatively connecting a remote end of the second member to the slideable panel, wherein when the locking apparatus is operatively connected to the slideable panel and the surface, the



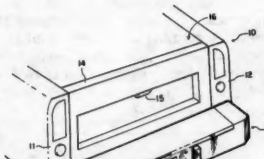
slideable panel can be freely slid in the closed direction but cannot be slid in the open direction unless the locking mechanism is activated;
(iv) the means for connecting a remote end of the first member to the surface comprising a bracket for mounting on the surface;
(v) the remote end of the first member being pivotally attached to the bracket for mounting on the surface, said bracket having at least one arm and a pivot pin which passes through at least one arm and through the remote end of the first member; and
(vi) means for holding the slideably attached members in an inoperative position.

4,570,986

COMBINED PICKUP BUMPER AND TOOL BOX

Jimmie L. Sams, 3097 Stony Way, Marysville, Calif. 95901

Filed Dec. 3, 1984, Ser. No. 677,744
Int. Cl.⁴ B60R *19/02*
U.S. Cl. 293—117 **10 Claims**



1. A bumper assembly for an automotive vehicle comprising:
a front vertical wall member having means for attachment to the vehicle,
a bottom wall member fixed to the bottom of said front wall member and extending horizontally away from the vehicle,
a pair of elongated box structures having bottom, side and end walls to provide a pair of open topped boxes for holding tools,

means for attaching each box to the bottom wall member in a position with an elongated side extending along said front wall member, said attaching means allowing each box structure to be pivoted about one end to a position with the elongated sides extending normal to said front wall member to provide easy access to the box structure interiors, and,

a cover pivotally attached to said front wall member to normally extend horizontally over and cover said box structures.

4,570,987

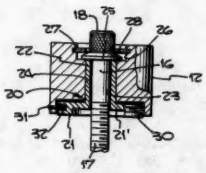
SWIVEL EYEBOLT

Hon Wong, 920 Jacmar Dr., Montebello, Calif. 90640, and Shui K. Tsui, Walnut Grove Ave., Rosemead, Calif. 91770

Filed May 14, 1984, Ser. No. 609,898

Int. Cl.[4] B23B *43/00*

U.S. Cl. 294—1.1 **8 Claims**



1. A multi-position fixture of multiple parts for fixed attachment to a load member comprising a load-engaging stud, a collar having a swivel engagement with the stud and adapted to rotate throughout substantially a full circle, recess means in said collar, a ring component, a portion of said ring component comprising a transversely extending pivot pin structure disposed in said recess means and movable in said recess means throughout an arc of substantially a half circle for all positions of rotation of said collar, said pivot pin structure comprising substantially homogeneous portions of said ring member, the pivot pin portion of said structure comprising a pair of radially inwardly directed pivot pins in axial alignment, inner ends of said pins being spaced from each other on opposite sides of said collar, said stud having a head and a shank, said shank having a continuous and uninterrupted threaded section, a bushing on said stud and within said collar, a portion of said bushing comprising bearing means between the collar and the load member and retention means connected respectively between said bushing and said collar for holding said parts in assembled condition prior to attachment to said load member.

4,570,988

REINFORCED TOOL HANDLE AND METHOD OF MANUFACTURING SAME

Joseph A. Carmien, 525 Maple Ave., Beverly Hills, Calif.

Continuation of Ser. No. 407,818, Aug. 13, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 667,408

Int. Cl.[4] B25G *1/10*

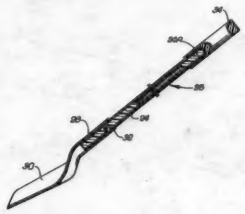
U.S. Cl. 294—57 **21 Claims**

1. A method for producing a continuous fiber-resin composite rod having an alternately non-reinforcing and reinforcing core, said method comprising the steps of:

alternately feeding sections of non-reinforcing core and relatively strong reinforcing core into the center of a pultrusion die tube;

surrounding said core sections with resin coated fibers;

pulling said core sections through the pultrusion die tube while keeping said core sections surrounded by said resin coated fibers; and



curing said resin coated fibers about said core sections to form a bond therewith.

4,570,989

SUN VISOR FOR VEHICLES PROVIDED WITH A PROTECTIVE SUN VISOR PLATE

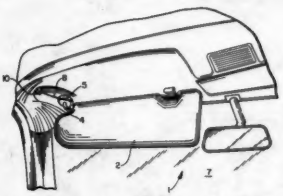
Günter Gmeiner; William Hugger, both of Sindelfingen, and Rudolf Binder, Schoenaich, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,406

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 3246941

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—97 J **3 Claims**



1. A sun visor having a protective sun visor plate for the windshield of a vehicle, said protective sun visor plate is pivotal and axially displaceable on an essentially horizontal mounting rod, and in which the mounting rod is retained by means of an angularly bent end section thereof in a fixed bearing support so as to be pivotal about an approximately vertical axis, characterized in that a lever is operatively and pivotally connected with the protective sun visor plate and pivotally secured at the vehicle, said lever being operable during pivoting of the mounting rod about the approximately vertical axis to bring about an axial displacement of the protective sun visor plate on the mounting rod.

4,570,990

VISOR COVERING

Carl Flowerday, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Continuation of Ser. No. 490,363, May 2, 1983, Pat. No. 4,494,789. This application Sep. 18, 1984, Ser. No. 651,776

Int. Cl.[4] B60J *3/00*

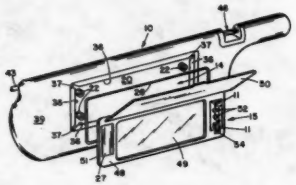
U.S. Cl. 296—97 H **5 Claims**

1. An edge construction for the periphery of a visor comprising:

a visor body of a molded resilient polymeric material including two substantially hollow core halves wherein each of said core halves include a surface which mates with a corresponding surface on the other core half; and

upholstery material surrounding said core halves of said visor body and including edge portions wrapped around

the peripheral edge of said core halves, said edge portions adhered to said peripheral edge of said core halves by an adhesive, and wherein said core halves are fused together



to additionally secure said edge portions by compressing said upholstery material around said periphery between the facing peripheral edges of said core halves to hold said material in place.

4,570,991

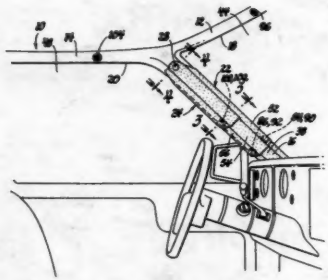
SUN VISOR STOWED ON PILLAR

Leonard A. Lystad, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1983, Ser. No. 537,106

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97 G **4 Claims**



1. A sun visor for shading the eyes of the occupant of a motor vehicle having a windshield header supported by a windshield pillar and comprising:

a panel adapted for mounting in a horizontal extending position in parallel relationship with the windshield header to shade the vehicle occupant; and

pivot means mounting the panel on the vehicle body adjacent the juncture of the windshield pillar and the windshield header to support the panel for pivotal movement in an arcuate path about the pivot means between the horizontal position parallel with the windshield header and a stored position in parallel overlying relationship with the windshield pillar.

4,570,992

TILT-OUT ROOF FOR VEHICLES

Arpad Fürst, Munich, and Richard Igel, Germering, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

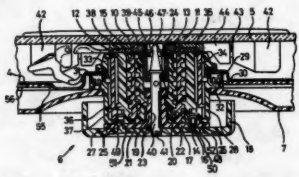
Filed May 18, 1984, Ser. No. 611,942

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324838

Int. Cl.[4] B60J *7/08*

U.S. Cl. 296—223 **18 Claims**

1. A tilt-out roof for vehicles having a closure panel arranged in the area of an opening in a vehicle roof, a frame that extends around an edge of the roof defining said opening, and a telescopic jack for the lifting and lowering of a rear part of the closure panel relative to said frame, said jack being connected between the frame and the closure panel and having several threaded parts that engage with one another so as to be movable with respect to the frame by operation of a turning handle connected thereto, wherein the turning handle has a rotary plate connected to the telescopic jack and a handle rim



that is detachably connected to the rotary plate, and wherein the connection of the rotary plate to the telescopic jack enables the rotary plate to form a securing means for holding the threaded parts of the telescopic jack in a predetermined position with respect to one another when the handle rim is removed.

4,570,993

POCKET CHAIR

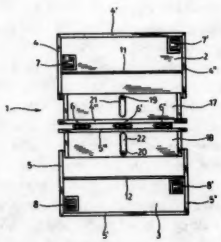
Martin Widerker, Botnanger Steige 10, 7000 Stuttgart 1, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 576,938

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304933; Aug. 6, 1983, 3328490

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—17 **7 Claims**



1. A foldable pocket chair comprising:

a pair of open-sided box sections each including a seating surface situated opposite an open side of said box section, said box sections being pivotably secured together for being

unfolded wherein said seating surfaces are generally coplanar, and

folded-up wherein said open sides face one another,

a plurality of support legs pivotably secured to each of said box sections, each said support leg comprising a plurality of segments pivoted together to be foldable into one another when said first and second box sections are folded-up,

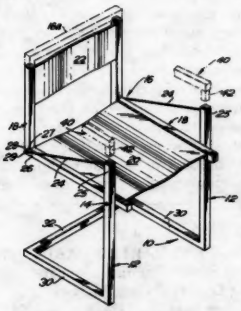
each of said segments comprising first and second mutually bent parts arranged such that when each support leg is folded said first parts thereof are generally parallel and disposed within the associated one of said box sections, and said second parts thereof are generally parallel and project toward and into the other of said box sections, said second parts of each of said box sections being offset and generally parallel relative to said second parts of the other box section when said box sections and said support legs are folded-up.

4,570,994

FOLDABLE CHAIR

Charles Lowrey, 770 Park Ave. (7D), New York, N.Y. 10021

Filed Dec. 17, 1982, Ser. No. 450,741
Int. Cl.[4] A47C *4/04, 7/54;* A47B *5/04*
U.S. Cl. 297—19 5 Claims



1. A foldable chair comprising:

a base having spared apart upstanding portions extending upwardly from opposite sides of a forward portion thereof, and runner portions extending rearwardly from lower end of respective upstanding portions,

a seat member having a rear portion and a forward end portion, said forward end portion being connected pivotally between said upstanding portions of said base, said upstanding portions of said base extending upwardly of said pivotal connection of said seat member by a substantial distance and having free upper ends,

a backrest portion extending upwardly from said rear end of said seat portion,

a respective flexible, non-extendisble, tension element connected between an upper free end of each upstanding portion and respective rear portions of said seat member for holding said seat member in an operative seating positon relative to said base, said flexible tension elements being fixedly connected to said respective rear portions of said seat member, and being removably connected to said respective upper free ends of each upstanding portion of said base, said flexible tension elements being removably connected to said free upper ends at a position spaced a substantial distance above said pivotal connection, and

releasable retaining means for releasably connecting said flexible tension elements to said free upper ends, said releasably retaining means including at least one nub formed on an end portion of each respective flexible tension element, and a respective slot formed in the associated free upper ends, said slot having a portion having a width wider than the width of each said nub and narrowing to a portion narrower than the width of each of said nub whereby a nub can be inserted in said slots and held behind said narrow portions thereof,

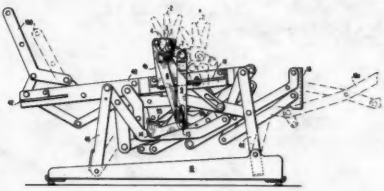
said flexible tension elements being releasable from said free upper ends and thereby enabling said seat member to be pivoted forwardly about said pivotal connection into a position wherein said backrest portion is nested within said runner portions of said base and said seat portion is nested within said upstanding portions of said base to provide a compact, stackable nested structure.

4,570,995

TWO-WAY ACTUATOR FOR RECLINING CHAIR

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Filed Dec. 6, 1984, Ser. No. 679,026
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—68 7 Claims



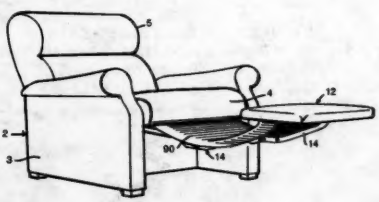
1. In a recliner chair having a footrest movable between extended and retracted positions, and means including a drive element for moving the footrest to the extended position; an actuator system including a prime mover movable in either of two opposite directions, and linkage means interconnecting the prime mover and the drive element to actuate the drive element to cause extension of the footrest upon movement of said prime mover in either of said opposite directions.

4,570,996

FOOTREST ASSEMBLY FOR RECLINER CHAIRS

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Filed Mar. 24, 1983, Ser. No. 478,228
Int. Cl.[4] A47C *1/035*
U.S. Cl. 297—85 32 Claims



1. In a reclining chair including a seat, the improvement comprising a footrest assembly including in combination, a footrest, a pair of laterally spaced support members mounting the footrest to the chair for movement between a retracted position generally below the seat and an extended position projected forwardly of the seat, and a cover fixed at its opposite ends to the chair and the footrest and at its opposite sides to the support members to be movable with the footrest between the retracted and extended positions, and wherein said cover has opposite side portions covering and directly attached to said support members and has intermediate portions extending over and covering the space between said support members when the footrest is in the extended position.

4,570,997

SLIDING LOCK MECHANISM FOR ROTARY SEAT ASSEMBLY

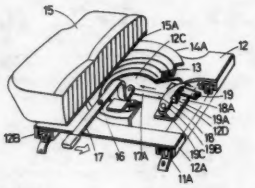
Hiroyuki Tanizaki, Yokohama; Kazuma Sato, Nagoya; Kiyohiko Munakata, Yokohama, and Yuzo Kanazawa, Fuwa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 8, 1983, Ser. No. 512,018

Claims priority, application Japan, Jul. 14, 1982, 57-123448

Int. Cl.[4] A47C *3/18*

U.S. Cl. 297—349 **6 Claims**



1. In a rotary seat assembly comprising rails mounted on a floor, a lower base having leg portions on the lower surface thereof, said leg portions being slidably fitted to the rails, an upper base rotatably mounted on said lower base, a seat mounted on said upper base and a sliding lock mechanism for said rotary seat assembly comprising a lock means to lock the sliding movement of the leg portions relative to said rails and an operating means connected to said lock means, said sliding lock mechanism characterized in that said operating means is mounted to said upper base to provide said lock means with a substantially horizontal movement and that the location where the operating means is rotatably connected to said lock means is positioned on the substantially vertical rotation centerline of said upper base when said lock means is positioned to lock said leg portions;

wherein said operating means has an operating lever which is connected to said upper base at a first location to substantially horizontally rotate about said first location and is connected to said lock means at a second location to substantially horizontally operate said lock means, and wherein said second location is positioned on the substantially vertical rotation centerline of said upper base when said lock means is positioned to lock said leg portions.

4,570,998

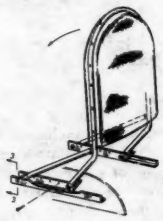
MOTORCYCLE BACKREST SEAT

Jerry J. Hughes, 2475 Tusitala, No. 2, Honolulu, Hi. 96815

Filed Nov. 19, 1984, Ser. No. 672,615

Int. Cl.[4] B60N *1/06*; A47C *1/02*; B62J *1/00*

U.S. Cl. 297—353 **1 Claim**



1. A combined backrest and passenger seat for a motorcycle, comprising:

combined backrest and pad means and

mounting means for mounting the backrest and pad means on a motorcycle so that the backrest and pad means is selectively movable between a first position that enables the backrest and pad means to operate as a backrest for a motorcycle operator and a second position that enables the backrest and pad means to operate as a passenger seat, the mounting means including a pair of brackets mounted on opposite sides of the motorcycle, a pair of pivot arms mounted on the backrest and pad means and pivotally connected to the brackets, and support arms pivotally connected at one end to the brackets and adapted to be removably connected to the pivor arms for supporting the backrest and pad means in the first position, the support arms being disconnectable from the pivot arms and moved to a storage position so that the backrest and pad means can be moved to the second position, the support arms including means for biasing the end connected to the brackets out of alignment with the pivot arms for providing greater support for the backrest and pad means in the first position and allowing the support arms to be moved to the storage position when the backrest and pad means is moved to the second position without the pivot arms and the support arms interfering with each other.

4,570,999

RECLINING SEAT PARTICULARLY FOR VEHICLES

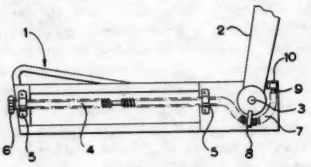
Neil Harrison, Sutton Coldfield, England, assignor to I.H.W. Engineering Ltd., Warwick, England

Filed May 30, 1984, Ser. No. 615,182

Claims priority, application United Kingdom, May 31, 1983, 8314900; May 31, 1983, 8314902

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—362 **6 Claims**



1. A seat comprising:

a cushion portion and a back portion pivotally connected thereto;

a flexible externally screw-threaded tubular drive member arranged to rotate around a rigid supporting core attached to one of said portions;

drive means for imparting rotational movement to said drive member and operatively associated with said drive member;

the drive member being rotatably attached to said one portion, and said rigid supporting core having a part which forms a segment of a circle around the pivot point for the back portion relative to the cushion portion; and

an internally threaded member secured to the other of said portions and operatively engaging said part, whereby rotation of the drive member causes the internally threaded member to move around said segment, thereby causing relative pivoting motion of the two portions.

4,571,000

VEST TYPE RESTRAINING GARMENT

Ocie S. Holder, 302 Witten La., Gastonia, N.C. 28052

Filed Jun. 7, 1984, Ser. No. 618,237

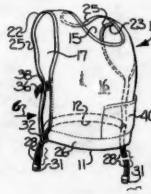
Int. Cl.[4] A47C *31/00*

U.S. Cl. 297—465 **10 Claims**

1. A garment for securing a person to a bed, chair, or other supporting structure, which is characterized by the ability to closely conform to the body of the wearer so as to effectively and comfortably hold the wearer in place without undue cinching about the waist, and comprising:

a generally rectangular elongate sheet of flexible material having opposite end edges and opposite side edges, and defining a corner at each junction of the side and end edges, said sheet including an opening in a medial location to define front and rear panels on opposite sides of the opening so that said sheet is adapted to be positioned on a wearer with the wearer's head extending through said opening and with the front and rear panels respectively overlying the chest and back of the wearer;

flexible elongate tie means supported by one of said panels and including a free end portion extending outwardly from each corner thereof;



a pair of interconnecting means supported by the other of said panels, with one of said interconnecting means being located adjacent each corner thereof, and with each of said interconnecting means being adapted to engage a respective one of said free end portions of said tie means; and

elastic means extending along substantially the entire length of said end edge of said other panel and at least substantially between said pair of interconnecting means to form a gathered edge for conforming the sheet to the body of the wearer and resisting the riding up of the sheet.

4,571,001

FASTENING DEVICE

Bengt E. W. Hakansson, Ekgatan 8, S-662 00 Åmål, Sweden

Filed Jun. 7, 1984, Ser. No. 618,344

Claims priority, application Sweden, Jun. 28, 1983, 8303683

Int. Cl.[4] A47D *15/00*

U.S. Cl. 297—483 **11 Claims**

1. A fastening device for adjustably fastening an article to a carrier in one of a plurality of positions relative to said carrier, said device comprising:

elongated runner means, connectable to said article, for supporting said article, said runner means having a longitudinal axis and an axial opening therethrough extending along said longitudinal axis;

track means, having an axis parallel to said runner means axis and axially receivable within said axial opening of said runner means, for slidingly supporting said runner means for axial movement relative to said track means;

connecting means for fixedly connecting said track means to said carrier;

mounting means, operatively connected to said connecting means, for maintaining said track means spaced from said carrier a distance sufficient to provide a clearance for unhindered axial movement of said runner means relative to said track means; and

locking means for releasably locking said runner means to said track means in one of said plurality of positions, said locking means comprising

means defining a plurality of apertures in said track means, each of said apertures corresponding to one of said plurality of positions;

lock pin means, connected to said runner means, for releasable engagement with one of said plurality of apertures, said lock pin means movable relative to said runner means from a first position to a second position, said lock pin means, when in said first position, receivingly engaged within said aperture and, when in said second position, being removed therefrom;

biasing means for yieldably urging said lock pin means to said first position; and

manual actuation means for moving said lock pin means from said first position to said second position to permit relative sliding movement between said runner means and said track means.

4,571,002

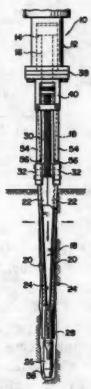
HYDRAULIC ROCK SPLITTER

Shigetake Akanuma, Chigasaki; Satoshi Takashima, Kanagawa; Haruo Imamura, and Yoshitaka Ojiro, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 10, 1984, Ser. No. 608,684

Int. Cl.[4] E21C *37/04*

U.S. Cl. 299—22 **4 Claims**



1. A hydraulic rock splitter comprising:

(a) a hydraulic cylinder assembly having a cylinder body and a piston rod directed downwardly therefrom;

(b) a slider wedge coupled to the piston rod of the cylinder assembly and extending downwardly therefrom, the slider wedge being thrusted downwardly by the cylinder assembly;

(c) a pair of presser cheeks adapted for insertion in a drill hole and arranged for relative sliding engagement with opposite sloping edges of the slider wedge so as to laterally move away from each other upon downward thrust of the slider wedge by the cylinder assembly;

(d) two pairs of opposed leaf springs disposed on each side of the slider wedge for connecting the pair of presser cheeks

to the cylinder body of the cylinder assembly so as to allow the presser cheeks to move away from each other, each pair of leaf springs being rigidly connected at lower ends thereof to one of the presser cheeks, being spaced from each other, and being normally closely held against the other pair of leaf springs on the same side of the slider wedge;

(e) elastic means interposed between the upper ends of the leaf springs and the cylinder body of the cylinder assembly so as to allow upward displacement of the leaf springs together with the presser cheeks to a predetermined limit relative to the cylinder body; and

(f) stop means on the cylinder body of the cylinder assembly adapted to allow the upward displacement of the presser cheeks with the leaf springs up to the predetermined limit but to positively arrest any further upward displacement of the presser cheeks relative to the cylinder body in order to prevent the buckling of the leaf springs.

4,571,003

APPARATUS FOR CONTROLLING THE POSITION OF A MINERAL MINING MACHINE

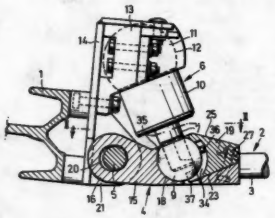
Franz Roling, Nordkirchen; Gerhard Merten, and Bernd Steinkuhl, both of Lünen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,375

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1983, 3300306

Int. Cl.⁴ E21D *23/00*; E21C *27/32*

U.S. Cl. 299—33 **9 Claims**



1. In apparatus for controlling the position of a mineral mining machine movable along guide means and comprising bracket means connected to said guide means, at least one elongate beam displaceable relative to a roof support, connection means effecting pivotal connection between the guide means and said beam and at least one inclined piston and cylinder unit connected between the connection means and the bracket means and operable to adjust the position of the guide means; the improvements comprising: the unit is connected to the connection means with a ball-and-socket joint, the connection means takes the form of a multi-part head-piece with a main body for resting on the floor of the mine working and a detachable complimentary part, said main body having means for effecting pivotal connection with the guide means, means for fixing the body to said at least one beam, a curved recess in the body forming part of the socket of said ball-and-socket joint and an inclined upper mounting surface on the body which extends to a lower region of the curved recess, and said complimentary part having a curved recess which forms the remaining part of said socket with an inclined lower mounting surface on said complimentary part which is engageable with said inclined surface of the main body, the body and the complimentary part having alignable bores which are inclined away from the bracket means and receive fixing bolts which detachably secure the complimentary part to the main body.

4,571,004

MECHANISM FOR CONTROLLING THE ELEVATION OF A COAL PLANER

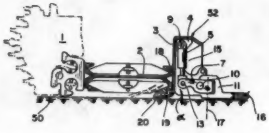
Ernst Braun, and Gert Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun Industrieanlagen, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,615

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244230

Int. Cl.⁴ E21C *27/32*

U.S. Cl. 299—34 **5 Claims**



1. A device for adjusting a coal planer conveyor in height as it moves over a coal face with the planer carried on one side of the conveyor and wherein the conveyor includes an opposite side wall opposite to the planer side wall, comprising a bracket secured to the opposite side wall and having a bottom edge extending at a selected angle below the bottom of the conveyor in a direction toward the planer, a control lever having an outer arm and an opposite inner arm being pivotally mounted on a first axis intermediate its ends on said bracket, an abutment disposed on the opposite side of the conveyor, said control lever outer arm being pivotally supported on said abutment for pivoting about a substantially vertical axis, and a fluid pressure operated piston and cylinder combination pivotally connected between said upper portion of said bracket and said control lever inner arm portion and being extensible and retractable to cause the bottom edge to protrude by a selected amount into the coal face so as to vary the height of the coal planer, the connection of said fluid pressure operated piston and cylinder combination to said bracket comprising a fixed pin carried on said bracket defining a first pivot axis, the connection of said fluid pressure operated piston and cylinder combination to said control lever comprising a bracket tilt axis pin on said control lever defining a second pivot axis and the pivotal axis of said lever on said bracket defining a third pivot axis, all of said first, second and third pivot axes defining a triangle.

4,571,005

WHEEL, ESPECIALLY DISK WHEEL

Franz Nowak, Taufkirchen; Albert Gietl, Brannenburg; Rolf Leo, Wertingen, and Gerhard Singer, Munich, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,277

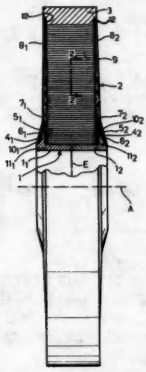
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345555

Int. Cl.⁴ B60B *1/06*

U.S. Cl. 301—63 PW **9 Claims**

1. In a wheel having a hub (1) with a rotational axis (A), a wheel rim (3) and bending resistant means (2) operatively interconnecting said wheel rim (3) to said hub (1), the improvement comprising two hub sections (1_1; 1_2) which are substantially mirror symmetrical relative to a central radial plane through the wheel, each hub section (1_1; 1_2) comprising respective substantially radially extending flange means (4_1; 4_2) located at an axially outer end of the respective hub section (1_1; 1_2), said bending resistant means (2) comprising first and sec-

ond cover members (8_1; 8_2) for transmitting substantially radially extending forces from said wheel rim (3) into said hub (4), said bending resistant means further comprising body means (9) rigidly enclosed between said first and second cover members, first adhesive bonding means operatively connecting said flange means (4_1; 4_2) to the respective first and second cover members (8_1; 8_2), second adhesive bonding means operatively connecting said first and second cover disks (8_1; 8_2) to said wheel rim (3), third adhesive bonding means securing said body means (9) to said first and second cover members (8_1; 8_2),



to said hub sections (1_1; 1_2), and to said wheel rim (3), said body means comprising a structure which is thrust resistant in the direction of said rotational axis for transmitting substantially axially extending forces into said hub, wherein said radially extending flange means of said hub sections have a substantially triangular cross-section with substantially axially facing surfaces (6_1; 6_2; 5_1; 5_2) and a circumferential edge (7_1; 7_2) pointing substantially radially outwardly, and wherein each of said first and second cover members has two flaps (10_1; 11_1; 10_2; 11_2) reaching radially inwardly in a forked manner for hugging said substantially axially facing flange surfaces.

4,571,006

BRAKE PRESSURE CONTROL VALVE OF A DOUBLE PIPING SYSTEM

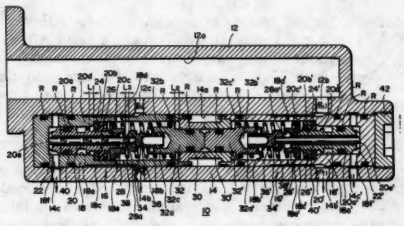
Hitoshi Kubota, Minami-ashigara; Teluo Yambe; Akira Ishii, both of Yokosuka, and Toshiyuki Takahashi, Kanagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nippon Air Brake Co., Ltd., Kobe, both of, Japan

Filed Nov. 16, 1982, Ser. No. 442,096

Claims priority, application Japan, Nov. 20, 1981, 56-186220; Nov. 20, 1981, 56-186221

Int. Cl.⁴ B60T *13/00*

U.S. Cl. 303—6 C **4 Claims**



1. A brake pressure control valve for a double piping hydraulic braking system, comprising:

a housing having a bore formed therein;

a pair of substantially identical valve units which are coaxially and symmetrically arranged in said bore;

first means removably connected to said housing for retaining said valve units in said bore,

wherein each of said valve units comprises a casing in which substantially all essential parts of the valve unit are housed, and second means removably connected to said casing for retaining said substantially all essential parts in said casing,

wherein said first means is arranged to secure the casing of each valve unit against translational movement relative to said housing; and

wherein said valve units are so arranged that when one of the units fails to operate upon application of hydraulic pressure thereto, the other unit keeps its open position regardless of the presence of conditions which would otherwise cause said other unit to assume a position other than said open position.

4,571,007

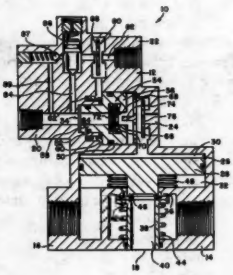
PROPORTIONING RELAY VALVE

Richard W. Carmichael, Parma, and John G. Nosse, Grafton, both of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed May 10, 1984, Ser. No. 608,687

Int. Cl.⁴ B60T *11/12*

U.S. Cl. 303—7 **9 Claims**



1. Proportioning control valve for a fluid pressure braking system comprising a housing, an inlet port, an outlet port, a control port, and an actuating pressure port carried by said housing, valve means in said housing for controlling communication between the inlet and outlet ports, means for operating said valve means for establishing a pressure level at said outlet port as a function of the pressure level at the control port, said operating means including proportioning means shiftable from a first condition wherein the operating means carries said valve means to establish a pressure level at the outlet port as a first function of the pressure level at the control port to a second conditon wherein said valve means establishes a pressure level at said outlet port as a second function of the pressure level at said control port, said proportioning means being responsive to the pressure level at said actuating pressure port to shift said proportioning means between the first and second conditions, and means responsive to a predetermined pressure level at said inlet port for overriding the pressure level at the actuating pressure port to cause said proportioning means to shift to said first condition regardless of the pressure level at the actuating pressure port.

4,571,008
CONTROL VALVE ARRANGEMENT

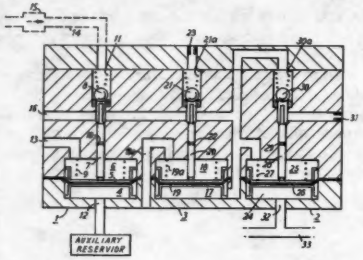
David J. Wickham, Chippenham, England, assignor to Westinghouse Brake & Signal Company, Chippenham, England

Filed Sep. 8, 1982, Ser. No. 416,079

Claims priority, application United Kingdom, Sep. 11, 1981, 8127541

Int. Cl.[4] B60T *15/22*

U.S. Cl. 303—33 10 Claims



1. A control valve arrangement for controlling a pilot pressure in a pilot pressure output passage in response to a change of a control pressure in a control pressure passage, comprising:

a plurality of independent valve means each arranged to be operated to an open positon by a respective pressure differential responsive operating means,

(a) a first of the operating means being responsive to a pressure difference between the control pressure and a first reference pressure in excess of a first predetermined level to open a first of the valve means to provide a communication between a first source of pressure and the output passage to provide said pilot pressure,

(b) a second of the operating means being responsive to a pressure difference between the control pressure and a second reference pressure in excess of a second predetermined level to open a second valve means to provide a communication between the output passage and an exhaust port to exhaust said pilot pressure, and

(c) a third of the operating means being responsive to a pressure difference between the pilot pressure and a third reference pressure in excess of a third predetermined level to open a third of the valve means to provide a communication between the output passage and a second source of pressure to maintain said pilot pressure.

4,571,009
PRE-PRESSURIZED ACCUMULATOR FOR HYDRAULIC BRAKE SYSTEM

Ed F. Jones, P.O. Box 141480, Spokane, Wash. 99214

Filed Sep. 23, 1983, Ser. No. 535,047

Int. Cl.[4] F16L *55/04*

U.S. Cl. 303—87 11 Claims

6. A resilient bulb and pressurization cap combination for hydraulic brake accumulators, comprising:

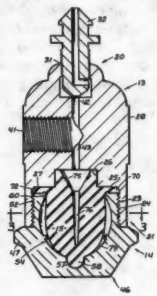
a resilient bulb having:

a resilient insertable plug with a distal end, proximate end, approximately circular cross-sectional shape and an interior void; and

a flange attached to the proximate end of the insertable plug for sealing;

a pressurization cap having:

an interior end, exterior end, interior cavity, and cavity opening connecting the interior cavity to the interior end; the cavity opening being larger in diametrical size than the distal end of the insertable plug and smaller in diametrical size than a substantial length adjacent the proximate end of the insertable plug, insertion of the insertable plug



causing air within the interior cavity to be pre-pressurized during insertion.

4,571,010
ANTI-SLIPPING SYSTEM

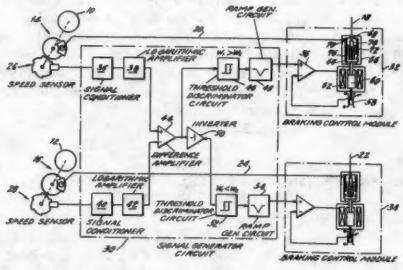
Adam Dittner, Höchstadt, and Joachim Sauer, Erlangen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,196

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236366

Int. Cl.[3] B60T *8/02*

U.S. Cl. 303—110 11 Claims



1. An anti-slipping system for use in a vehicle for preventing slippage between wheels of said vehicle which are equipped with hydraulic brakes, said system comprising:

first and second speed sensors for generating speed signals indicative of the rotational speed of first and second said wheels of said vehicle, respectively;

first and second braking control modules for adjusting the braking force applied to said first and second wheels as a function of first and second brake control signals, respectively; each braking control module being connected between a respective first fluid line connected to a source of fluid pressure and a respective second fluid line connected to a respective hydraulic brake on said respective first or second wheel; each braking control module comprising respective pressure means for receiving fluid through said respective first fluid line and selectively operable for gradually increasing and decreasing the fluid pressure applied to the respective hydraulic brake through said respective second fluid line for adjusting said braking force;

each said respective pressure means always applying a fluid pressure to the respective said second line which is at least

equal to the fluid pressure in its respective said first line; each said respective pressure means of said first and second braking control modules comprising:

(A) a housing having a first opening connected to its respective said first line and a second opening connected to its respective said second line, said openings communicating with a fluid pressure chamber of said housing;

(B) a piston situated in said housing and movable between a normal and a pressure applying position such that the volume of said pressure chamber is varied as a function of the position of said piston within said housing; and

(C) a valve closure member coupled to said piston and being movable between an open and a closed position with respect to said piston, said valve closure member being spring biased into its said closed position, said valve closure member being so positioned with respect to said piston and said housing that said valve closure member is removed from said first opening when said piston is in said normal position and is in contact with and closes said first opening once said piston has been moved part way from said normal position to said pressure applying position;

said first and second braking control modules each further comprising means responsive to the said respective brake control signal applied to the respective braking control module for adjusting the position of said piston in said housing; each said piston position adjusting means comprising:

(i) a detector for generating a position signal indicating the position of said piston

(ii) a difference circuit for receiving said position signal and said respective brake control signal and for generating a difference signal; and

(iii) a winding responsive to said difference signal for causing the position of said piston to change in accordance with said respective brake control signal; and

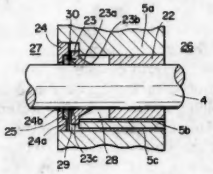
a signal generating circuit for generating said first and second brake control signals as a function of said first and second speed signals.

4,571,011

OIL SEALING BEARING FOR AXIALLY RECIPROCATING SHAFT

Yoshiyuki Muto, and Tadao Etani, both of Tokyo, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,873
Claims priority, application Japan, Feb. 23, 1983, 58-27588
Int. Cl.⁴ F16C *17/26;* F16J *15/16*
U.S. Cl. 308—3.5 **10 Claims**



1. An oil sealing bearing for an axially reciprocating shaft comprising:

a bearing body having a bore formed therein;

a first slide bearing element secured to said bearing body within said bore to support an axially reciprocating shaft;

cap means secured to said bearing body within said bore, and having a second slide bearing element therewithin, said bearing body, said first slide bearing element, said cap means and said axially reciprocating shaft cooperating to define an annular space which includes a small diameter section in the form of a gap space and a large diameter section in the form of an accommodating space; and,

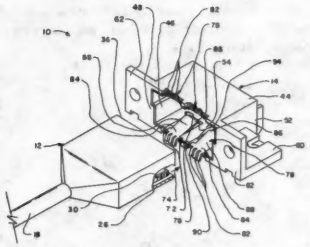
annular oil scraping means for scraping an excess amount of oil film to form a thin uniform film, said annular oil scraping means being in a loosely surrounding engagement with said axially reciprocating shaft and having a first section extending in said small diameter section and having a second section extending in a large diameter section, said second section of said annular scraping menas having an axial size smaller than said large diameter section of said annular space to permit restricted axial movement thereof.

4,571,012

SHIELDED ELECTRICAL CONNECTOR ASSEMBLY

Max Bassler, Austin, Tex., and Philip J. Dambach, Naperville, Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Dec. 21, 1984, Ser. No. 685,200
Int. Cl.⁴ H01R *4/66, 13/46*
U.S. Cl. 339—14 R **5 Claims**



1. A grounded receptacle assembly mountable in an opening of a panel having a grounded conductive surface for receiving and electrically engaging a shielded plug connector,

said plug connector including a housing, a plurality of terminals mounted in said housing and a conductive shield externally mounted on said plug housing,

said receptacle assembly including a receptacle housing with an open plug receiving end surrounded by a mounting face, a plurality of terminals mounted in said housing adapted to mate with said plug terminals and grounding means attached to said receptacle housing to connect the plug shield with the grounded panel,

the improvement comprising:

said receptacle grounding means including a plurality of spaced-apart stamped metallic clips which are not unitary with one another and which are mounted in the receptacle housing, each clip having a mounting portion secured in the housing, a plug engaging end in the housing adapted to contact the plug shield and a spring portion extending out of the plug receiving opening adjacent the mounting face for resilient compression against the panel surface; and

said receptacle housing including a plurality of slots formed in the mounting face and extending into the housing to receive the mounting portion of each clip therein.

4,571,013

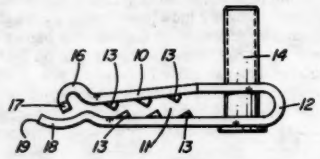
CONNECTOR FOR CABLE SHIELDS

Louis Suffi, Westchester, and Frederick W. Burtelson, Harvard, both of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 30, 1983, Ser. No. 537,440
Int. Cl.⁴ H01R *4/24, 13/648*
U.S. Cl. 339—14 R **9 Claims**

1. A connector for cable shields, the connector being in the form of a clamp comprising a length of metal bent to a U shape forming a bend and including two spaced, opposed, legs; tangs

formed in each leg, the tangs extending inward into the space between the legs; said legs forming inner and outer legs, the outer leg including a forward end remote from said bend, said



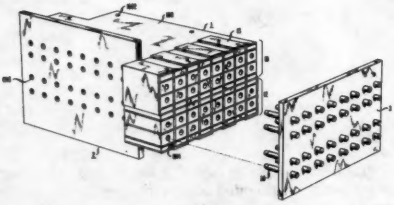
forward end having a hooked shape viewed from a side, the hooked shape extending outwards, then forward, round and inwards to a rearward facing end surface; and a clamping bolt extending through the legs adjacent to the bend.

4,571,014

HIGH FREQUENCY MODULAR CONNECTOR

Max S. Robin, Denville; Peter J. Tamburro, Toms River, and Roger E. Weiss, Denville, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 2, 1984, Ser. No. 606,141
Int. Cl.[4] H01R *13/46, 4/66*
U.S. Cl. 339—14 R **16 Claims**



12. A modular connector (1) for use with a circuit board (2) and backplane apparatus (3) comprising:

means for interconnecting the circuit board with the backplane apparatus

CHARACTERIZED IN THAT:

said interconnecting means comprises:

a pair of connector modules (10, 12) each having a first conductive shield member (100) separating a pair of epoxy glass circuit board members (101) each having insulated female contacts (1014) aligned and positioned along one edge thereof for engaging male pins of the backplane apparatus and male contacts (1013) aligned and positioned along an edge adjacent said one edge, for engaging the circuit board;

electrical conductor paths (1010) positioned on an outer surface of said epoxy glass circuit board members for connecting each insulated female contact with a corresponding one of said male contacts;

electrical shield paths (1012) positioned on said epoxy glass circuit board members outer surfaces for separating adjacent ones of said electrical conductor paths;

a pair of spacer members (102) each positioned over said electrical conductor and shield paths for insulating said electrical conductor paths;

a second conductive shield member (100) positioned over one of said spacer members for shielding ones of said electrical conductor paths;

a third conductive shield member (11) juxtaposed between adjacent ones of said spacer members of said pair of connector modules and coupled with said first and second conductive shield members and with said electrical shield paths for shielding said electrical conductor paths;

a corrugated conducting member (13) slidably inserted around said insulated female contacts and electrically engaging said third shield member for shielding said female contacts, and

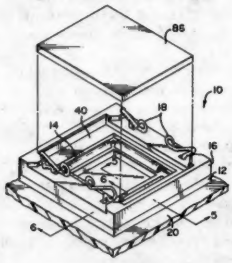
spring means (112, 113) of said third shield member for biasing said corrugated conducting member in engagement with rounding apparatus of the backplane apparatus to establish a common ground plane shielding said connector modules.

4,571,015

ELECTRICAL CONNECTOR HAVING ROTATING CLAMPS FOR SECURING ELECTRONIC PACKAGES THEREIN

Arthur L. Mueller, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 590,241, Mar. 16, 1984, abandoned. This application Mar. 29, 1985, Ser. No. 717,592
Int. Cl.[4] H01R *23/72*
U.S. Cl. 339—17 CF **14 Claims**



1. An electrical connector for electrically interconnecting a chip carrier to circuits on a circuit board, comprising:

a. a lower frame having slots located near the corners and extending therethrough, and passage means through which conductive means may extend;

b. an upper frame having a central opening, seats around the opening for receiving a chip carrier, a first surface displaced vertically upwardly relative to the seats, and four slots extending through the upper frame and opening out onto the first surface, and means to receive and retain conductive means, said upper frame adapted to be placed on the lower frame with the slots of both being in alignment;

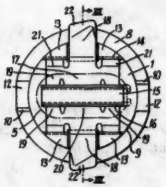
c. conductive means extending through the lower frame and received in the upper frame, said conductive means adapted to interconnect circuits on a chip carrier which may be positioned in the upper frame to circuits on a board on which the frames may be positioned; and

d. elongated clamps having a straight section extending through the aligned slots in the joined frames and through aligned slots in a circuit board on which the frames may be positioned, and further having looped lower ends extending below the circuit board, and upper ends which include a bearing section which extends laterally from and at a right angle to the straight section, said clamps being rotatable so that a chip carrier in the upper frame and the joined frames are biased against the conductive means and the circuit board respectively by reason of the looped lower ends bearing against the under side of the circuit board, and the bearing sections bearing against the chip carrier.

4,571,016
INDICATOR LIGHT FOR PRINTED CIRCUITS

Armand Debrabander, Milly la Foret, France, assignor to Vibrachoc, Saint-Cloud, France

Filed Apr. 20, 1983, Ser. No. 486,986
Claims priority, application France, Apr. 21, 1982, 82 06834
Int. Cl.[4] H05K 1/16
U.S. Cl. 339—17 D 12 Claims



1. An indicator light structure comprising:

a light source having two free terminal elements provided with contact portions;

a generally flat disk-shaped insulating support carrying said light source;

a printed circuit board having on one side of said board at least two circuit paths for supplying current to said light source;

fixing and connecting means for fixing said light source to said printed circuit board and connecting said two circuit paths to said two terminal elements, said fixing and connecting means comprising

(a) a circular aperture having two notches provided in said printed circuit board,

(b) a cylindrical annular edge portion defined on said support and having a diameter slightly less than the diameter of said aperture,

(c) an extension portion extending radially from said annular edge portion on a first side of said support and in bearing relation to the other side of said printed circuit board opposed to said one side of said printed circuit board,

(d) at least two electrically conductive metal strips disposed on and extending substantially radially on said support on a second side of said support to said first side, said metal strips extending substantially radially of said support beyond said annular edge portion so as to form two substantially radially extending end portions which pass through said notches of said aperture when initially assembling said support with said printed circuit board, which said end portions, after having been passed through said notches and been rotated in said board, are in contact with a respective one of said two circuit paths on said one side of said printed circuit board by a resilient deformation of said metal strips which tends to maintain said support clamped against said board,

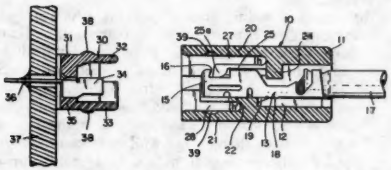
(e) means for locking said two terminal elements to said support in respective electric contact with said two metal strips including a pair of grooves in which a respective said contact portion of said two free terminal elements is located and into which a respective one of said two electrically conductive metal strips extends in contact with the associated said contact portion, and

wherein each of said metal strips includes a contact element fixed on said support and a clipping means for resiliently clipping each respective said contact element against said respective contact portion in said groove of said support, said clipping means comprising (a) a plurality of metal tabs on each contact element, (b) bosses on said support in which second grooves are defined, and (c) a diametrically extending central projection on said support in which said first-mentioned grooves are located, said tabs locking said contact portions of said terminal elements of said light source in position on said support and electrically contacting said terminal elements.

4,571,017
ELECTRICAL CONNECTOR ASSEMBLY

Yukihisa Fujita, Matsudo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1983, Ser. No. 547,810
Claims priority, application Japan, Nov. 4, 1982, 57-166189[U]
Int. Cl.[4] H01R 11/11
U.S. Cl. 339—59 M 4 Claims

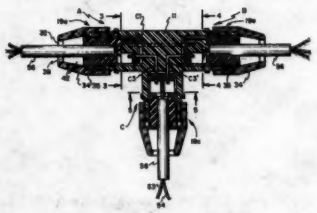


1. An electrical connector assembly comprising a first connector having a first housing with spaced parallel side walls defining a terminal-receiving passageway therein and a terminal retained in the terminal-receiving passageway, said housing being provided with a resilient arm which is provided on one of the inner surfaces of the side walls and which projects into the terminal-receiving passageway, said arm having a free end which is adapted to hold the terminal in the terminal-receiving passageway, and a second connector having a second housing with spaced parallel sidewalls which can be fitted into the side walls of the first housing, said second connector having another terminal arranged between the side walls thereof to be connected to the terminal of the first connector, said terminals being electrically connected to each other when the second connector is mated with the first connector, characterized in that the resilient arm extends parallel to associated side wall on which the resilient arm is provided and is spaced from the associated wall to define a space for receiving one of the side walls of the second housing between the associated wall and the resilient arm to limit the movement of the resilient arm in a direction away from the terminal when the second connector is mated with the first connector.

4,571,018
SEISMIC MARSH T-COUPLER WITH REMOVABLE POLARIZED CONNECTORS

Ira R. Annoot, Pasadena, Tex., assignor to Houston Geophysical Products, Inc., Houston, Tex.

Filed May 15, 1984, Ser. No. 610,472
Int. Cl.[4] H01R 13/52, 13/59
U.S. Cl. 339—60 R 3 Claims



1. A coupler for seismic leader cables comprising:

(1) a coupler body from which extend at least a pair of

sleeves, each sleeve having a tubular, outwardly-threaded front wall portion, an inner rear wall, a front port, and a connector chamber defined between the rear wall and the port; first connector contacts arranged on said rear wall in a predetermined polarized configuration; and spaced-apart conductors within the coupler body electrically interconnecting said first contacts to provide permanent polarized circuit paths between said sleeves;

(2) each sleeve operatively receiving a connector assembly, said assembly including:

(a) a connector element, second connector contacts arranged on said connector element in a configuration that corresponds to the configuration of said first contacts, said first and said second contacts being adapted to become operatively interconnected to each other;

(b) a resilient sealing grommet having a forwardly-tapering outer wall, a front wall, a rear wall, and an axial bore extending between its front and rear walls;

(c) an anchoring grommet having a rearwardly-tapering outer wall, a rear end wall, a front end wall, and an axial bore therebetween, a longitudinal center cut extending inwardly both from the anchoring grommet's front end wall and from its rear end wall, and said cuts lying in mutually perpendicular planes, said sealing grommet being positioned between said connector element and said anchoring grommet;

(d) a leader cable having an outer flexible jacket and internal insulated conductors, said cable extending through the longitudinal bores in the sealing grommet and anchoring grommets, and the conductors of the cable being electrically connected to respective ones of said second contacts; and

(e) an end cap having an internally-threaded front portion, a rearwardly-tapering rear portion, a front end opening, and a rear end opening, said end cap upon being threadedly secured to said front portion of said sleeve exerting pressure on the anchoring grommet to thereby cause (i) the outer wall of said sealing grommet to seal off the connector chamber against outside moisture penetration, (ii) the diameter of the bore in the anchoring grommet to become reduced, and (iii) the portion of the cable's outer jacket, contained within the anchoring grommet's axial bore, to become anchored to said coupler body body.

4,571,019

CONNECTING TERMINAL

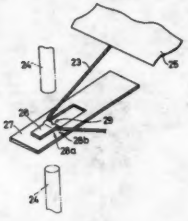
Junichi Arai, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,879

Claims priority, application Japan, Dec. 17, 1981, 56-188373[U]; Feb. 8, 1982, 57-16079[U]

Int. Cl.⁴ H01R *4/16*

U.S. Cl. 339—276 R **2 Claims**



1. A connecting terminal comprising plate means having a hook-like tab member protruding from one surface thereof and extending over said plate means in spaced substantially parallel relation thereto for receiving an insulated wire thereunder, means defining an elongated aperture in the bight of said hook-like tab member to facilitate the dispersal of gases and insulating residue during a subsequent fusing operation of said wire to said terminal and clamping means protruding from the same surface of said plate means as said hook-like tab member for securing the free end of said wire to said terminal, said clamping means being comprised of a piece protruding from said one surface of said plate means at an acute angle thereto and facing in the opposite direction from said hook-like tab member.

4,571,020

HOLOGRAM LIGHT DEFLECTOR

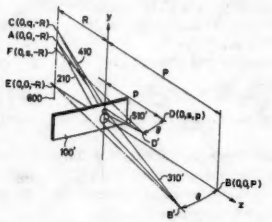
Hiromi Ishikawa, and Masaru Noguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1982, Ser. No. 453,865

Claims priority, application Japan, Jan. 6, 1982, 57-1243

Int. Cl.⁴ G02B *5/32*

U.S. Cl. 350—3.71 **13 Claims**



1. A method of recording a hologram plate for use in a beam scanner for reconstructing a scanning beam and a beam for generating a synchronous signal, said plate being disposed within an (x, y, z) coordinate system with its center at the coordinate axis (O, O, O), said method comprising the steps of:

illuminating a first reference light source for producing a spherical wave which diverges from a point A (O, Q, −R) and passes through said plate;

illuminating a first subject light source, coherent with said first reference light source, for producing a spherical wave which passes through said plate and converges on a convergence point B (O, O, P);

said spherical wave from said first reference light source and said spherical wave from said first subject light source producing a first set of interference fringes which are recorded on said plate;

illuminating a second reference light source for producing a spherical wave which diverges from a point C (O, q, −R) and passes though said plate;

illuminating a second subject light source, coherent with said second reference light source, for producing a spherical wave which passes through said plate and converges on a convergence point D (O, s, p);

said spherical wave from said second reference light source and said spherical wave from said subject light source producing a second set of interference fringes which are recorded on said plate;

developing said first and second sets of fringes recorded on said plate;

illuminating a first deflection light source for producing a spherical wave which diverges from said point A (O, Q, −R), passes through said first set of interference fringes recorded on said plate, and converges on said convergence point B (O, O, P);

illuminating a second deflection light source for producing a spherical wave which diverges from said point C (O, q, −R), passes through said second set of interference fringes recorded on said plate, and converges at said convergence point D (O, S, p); and

rotating said hologram plate about a reference line parallel

to said y-axis and having an origin W (O, O, −R), said hologram plate being rotated through an angle θ with respect to said x-axis, said spherical wave from said first deflection light source being deflected from said convergence point B to a convergence point B′ and describing an arc in space BB′ and said spherical wave from said second deflection light source being deflected from said convergence point D to a convergence point D′ and describing an arc in space DD′.

4,571,021

PLURAL-BEAM SCANNING APPARATUS

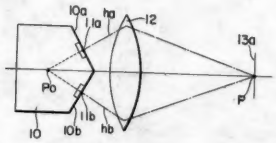
Kazuo Minoura, and Masamichi Tateoka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,420

Claims priority, application Japan, Jun. 25, 1982, 57-109368

Int. Cl.⁴ G02B *27/17*

U.S. Cl. 350—6.8 **11 Claims**



1. An apparatus for scanning a surface with a plurality of light beams, comprising:

a light source unit having a plurality of light-emitting portions each for emitting a light beam;

a deflector having a deflecting-reflecting surface for deflecting a plurality of said light beams emitted from said light source unit at one time in at least one deflection scan plane; said light emitting portions of said light source unit being disposed relative to said deflector so that the central rays of all of said plurality of light beams are emitted as if they originate from substantially the same point when viewed in a direction perpendicular to the deflection scan plane; and

optical means for making said same point and a point near said deflecting-reflecting surface of said deflector optically conjugate.

4,571,022

TWO ROW REDUCTION/ENLARGEMENT GRADIENT INDEX LENS ARRAY

William L. Lama, Webster, and James D. Rees, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

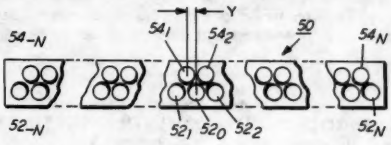
Filed Apr. 10, 1984, Ser. No. 598,756

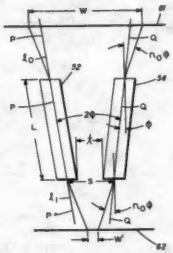
Int. Cl.⁴ G02B *5/17*

U.S. Cl. 350—96.25 **3 Claims**

1. A gradient index lens array having a plurality of gradient index optical fibers aligned in two rows, each fiber in each row having an axis which is substantially nonparallel to the axes of adjoining fibers, the array characterized by the optical axes of the fibers in each row being aligned along the same plane in the length direction, with the respective planes tilted away from each other and with the fiber exit faces of adjoining rows separated by a small distance, s.

3. An optical system for transmitting an image of an object lying in an object plane onto a parallel image plane at a magnification other than unity, said system comprising a gradient index lens array having a plurality of gradient index optical fibers aligned in two rows, the optical centers of each row lying along a symmetrical axis extending along the length direction of the lens array, each fiber in each row having an axis which is substantially nonparallel to the axes of adjoining fibers, the array further characterized by one row having a center fiber through which a plane extended in the width direction forms a right angle with said object and image planes





and a second row of said fibers whose axes are offset with respect to the central fiber of said first row.

4,571,023

DEVICE FOR OBSERVING PICTURES

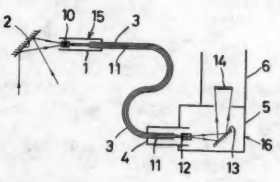
Kimizo Ono, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Apr. 6, 1984, Ser. No. 597,487

Claims priority, application Japan, Apr. 11, 1983, 58-63469; Apr. 11, 1983, 58-53822[U]

Int. Cl.⁴ G02B *6/06*

U.S. Cl. 350—96.25 **6 Claims**



1. A device for observing pictures of an object comprising an image transmission line for transmitting an image, an optical system for forming the image of the object at the front end of said image transmission line, a reflex mirror for reflexing the light from the object and directing it toward said optical system, said reflex mirror being in the form of an elongated circle having a minor axis perpendicular to the axis of said image transmission line and a major axis perpendicular to said minor axis, the ratio of the length of said major axis to that of said minor axis is equal to

$$\frac{\sec\theta}{\sqrt{\tan^2\theta - \tan^2\frac{\alpha}{2}}}$$

wherein θ is an angle formed between an extension of the axis of said image transmission line and the surface of said reflex mirror, and α is the vertical angle of the conic portion of the

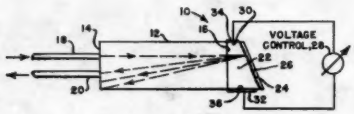
light reflected by said reflex mirror, a flexible cable accommodating said image transmission line, and an image receiving means provided at an end of said image transmission line for observing the image transmitted, said image transmission line having an image fiber comprising a bundle of optical element fibers.

4,571,024

WAVELENGTH SELECTIVE DEMULTIPLEXER TUNER

Charles R. Husbands, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 25, 1983, Ser. No. 545,307
Int. Cl.[4] G02F *1/03;* H04J *1/02*
U.S. Cl. 350—96.19 8 Claims



1. A wavelength selective demultiplexer tuner comprising:

an optically transmissive body having a front surface and a rear surface, said front surface being capable of receiving at a first preselected location thereon an input signal containing a plurality of different wavelengths, and said body being made of a material capable of directing said input signal therethrough;

means optically aligned adjacent said rear surface of said body for receiving said input signal after having passed through said body and for redirecting said input signal back through said body as a plurality of signals, each of said plurality of signals containing a different one of said wavelengths, respectively, and each of said signals following a different optical path through said body; and

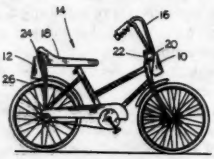
means operably associated with said plurality of signals for selectively changing said optical paths followed by said plurality of signals in order for each of said plurality of signals of said different wavelengths to be selectively output at different times from a same second preselected location on said body.

4,571,025

REFLECTIVE SYSTEM FOR BICYCLES

Robert V. Stephen, 4012 N. 127th Ct., Box 342, Omaha, Nebr. 68164

Filed Jul. 13, 1984, Ser. No. 630,633
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 16 Claims



1. A reflective system for a bicycle, comprising

a first upright generally triangular plate having front and back surfaces and generally defining an apex at the top and having a pair of side edges extended downwardly and outwardly therefrom to opposite ends of a bottom edge thereof,

said first plate being bent about an upright axis generally transversely aligned with the apex of said triangular first plate to provide a first folded triangle member,

the front surface of said first folded triangle member being covered with a bright highly reflective material, and

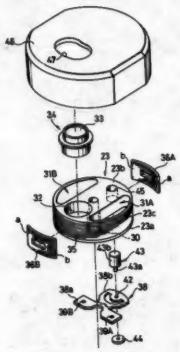
mounting means associated with said first folded triangle member for securing it in upright stationary relation to a bicycle.

4,571,026

DRIVING APPARATUS FOR AN OBJECTIVE LENS

Keiji Maruta, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,510
Claims priority, application Japan, Dec. 8, 1982, 57-215124
Int. Cl.[4] G02B *7/02, 7/04*
U.S. Cl. 350—247 2 Claims



1. An objective lens drive device comprising a base member having a support shaft extending therefrom, a lens holder member including a cylindrical side wall and an end wall extending across said side wall, said end wall having bearing means therein slidable axially on said support shaft, an objective lens mounted in said end wall for adjusting the focus of said objective lens in response to the axial sliding of said holder member along said shaft, a focusing coil wound circumferentially on the outer surface of said cylindrical side wall, and a magnetic circuit including a magnet, an inner yoke member extending from said base member within said cylindrical side wall and an outer yoke member arranged outside of said cylindrical side wall so that said focusing coil is situated in a magnetic gap of said magnetic circuit and causes said adjusting of the focus in response to a current flow through said focusing coil, said end wall of the lens holder member having an aperture opening therethrough and dimensioned and located to loosely receive a distal end of said inner yoke member and thereby avoid interference with relative movements of said end wall along said shaft in the direction toward said base member so that substantially the full axial dimension of said cylindrical side wall can accommodate said focusing coil for achieving sensitivity of said adjusting of the focus while minimizing the axial dimension of said lens holder member.

4,571,027

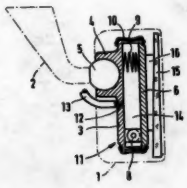
ADJUSTABLE REAR VIEW MIRROR

Manfred Klein, Leichlingen, Fed. Rep. of Germany, assignor to Metallwerk Frese GmbH, Leichlingen, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,309
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 8236802[U]
Int. Cl.[4] B60R *1/06*
U.S. Cl. 350—280 11 Claims

1. An adjustable rear view mirror for vehicles comprising: a

bearing secured on a supporting arm, a bearing plate secured to said supporting arm by said bearing, a mirror element, a supporting plate attached to said mirror element, said supporting plate being tiltable with respect to the bearing plate such that said mirror element is adjustable with respect to the bearing



between two tilt positions, a housing for the mirror element, said housing being secured to said bearing plate, and a vacuum system provided for the adjustment of said supporting plate and mirror element, said vacuum system comprising a vacuum box connected to a suction line, said vacuum box comprising said bearing plate and said supporting plate.

4,571,028

MOUNT FOR AN OPTICAL COMPONENT

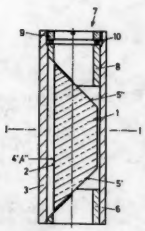
Klaus Ziegler, Heerbrugg; Peter Zünd, Balgach; Jürg Gees, Heerburgg, and Josef Mäder, Rebstein, all of Switzerland, assignors to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

Filed Jun. 3, 1982, Ser. No. 384,635

Claims priority, application Switzerland, Jun. 11, 1981, 3853/81

Int. Cl.⁴ G02B *7/18, 7/00*

U.S. Cl. 350—287 **11 Claims**



1. A mount, for an optical component having a flat surface between two parallel edges, comprising:

a support body having means defining a concave cylindrical surface for receiving the optical component with the two parallel edges thereof contacting said cylindrical surface along two parallel lines; and

fixing means attached to said support body, for engaging at least one other surface of the optical component, and for engaging the two parallel edges of the optical component against said concave cylindrical surface,

said fixing means including at least one resilient element for obtaining a statically defined mounting with self-alignment of the optical component in said support body.

4,571,029

ELECTRO-OPTICAL SWITCHING AND MEMORY DISPLAY DEVICE

Terje A. Skotheim, East Patchogue; William E. O'Grady, Center Moriches, and Clovis A. Linkous, Stony Brook, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 29, 1983, Ser. No. 566,757

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—357 **12 Claims**

1. An electro-optical display device comprising;

wall means defining a housing, said wall means including a transparent wall and at least one other wall,

display electrode means positioned on the inner side of said other wall,

counter electrode means positioned on the inner side of said transparent wall,

a thin electrically conductive polymer film incorporating pigment molecules embedded therein as counter ions, said film being disposed over the display electrode means,

an electrolyte disposed within said housing and in conductive relationship with said counter electrode means and said film over the display electrode means,

said display electrode means and said counter electrode means being adapted to have electric circuit means connected to them for selectively varying the electric potential applied by them across the electrolyte and the polymer film,

said device being operable to electronically and rapidly change said pigment molecules embedded in the polymer film, responsive to predetermined variations in the electric potential applied across said film, thereby to selectively quickly change the color of said film as it is seen through said transparent wall.

4,571,030

SUM-BEAM SEPARATOR USING CRITICAL ANGLE

William D. Fountain, Fremont, Calif., assignor to Cooper Laser-Sonics, Inc., Santa Clara, Calif.

Filed Apr. 4, 1983, Ser. No. 481,771

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—385 **48 Claims**

1. A sum-beam separator comprising:

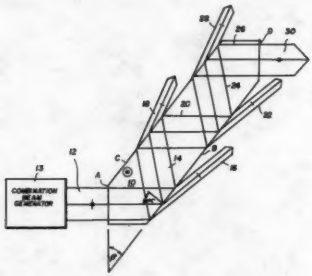
a positive uniaxial crystal having good transmission properties in the ultraviolet spectral range;

said crystal having an input face, an output face, and first and second parallel faces, wherein each of said faces is parallel to said crystal axis; and

means for generating a combination beam having a component existing in a predetermined range of shorter wavelengths and a component existing in a predetermined range of generally longer wavelengths, said components being orthogonally polarized, one to the other, said beam, when traveling through said crystal in a predetermined orientation, being such that the critical angle of the lon-

gest of the wavelengths in said range of shorter wavelengths is less than the critical angle of the shortest of the wavelengths in said range of longer wavelengths;

said crystal being arranged relative to said combination beam such that said beam enters said crystal through said



input face in the predetermined orientation and impinges upon said first face at an angle greater than critical angle of the longest of the wavelengths in said range of shorter wavelengths and less than the critical angle of the shortest of the wavelengths in said range of longer wavelengths.

4,571,031

WIDE ANGLE ZOOM OBJECTIVE

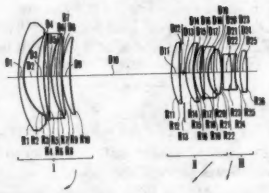
Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1983, Ser. No. 459,701

Claims priority, application Japan, Feb. 1, 1982, 57-14540

Int. Cl.⁴ G02B *9/64, 15/14*

U.S. Cl. 350—426 **8 Claims**



1. A wide angle zoom objective having the following conditions:

first, second and third lens units arranged from front to rear;

the first lens unit having a negative refractive power and at least one lens with an aspherical surface;

the second lens unit having a positive refractive power;

the third lens unit having a negative refractive power, and said lens being arranged so that zooming is performed by differentially moving said first lens unit, said second lens unit, and said third lens unit;

wherein when the focal length of the lens having an aspheric surface is denoted as f_{MO}, and the focal length at the wide angle end of the total lens system is expressed as fw, the following inequality is satisfied: $|f_{MO}| < 10fw$.

4,571,032

ZOOM LENS

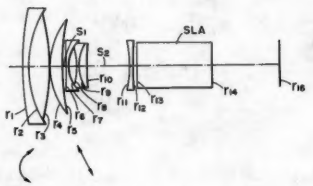
Atsushi Someya, Machida, and Shigeyuki Suda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,742

Claims priority, application Japan, Jan. 22, 1981, 56-8218

Int. Cl.⁴ G02B *5/14, 5/16, 15/14, 15/18*

U.S. Cl. 350—427 **7 Claims**



1. A zoom lens, comprising:

a zoom portion for forming a virtual image of an object lying between infinity and a very short distance always at a predetermined position and for varying the imaging magnification of the virtual image, said zoom portion being constructed so that the principal ray of each light ray emitted from said zoom portion be substantially parallel to the optical axis thereof; and

a relay portion including an erecting one-to-one magnification compound-eye optical system disposed between said zoom portion and an image surface for forming a real image of the virtual image of said object on the image surface, said relay portion being fixed during the zooming operation.

4,571,033

ZOOM LENS

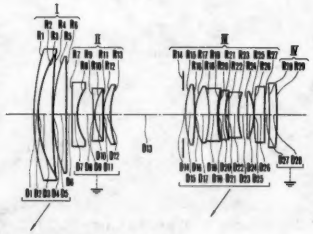
Masatake Kato; Nozomu Kitagishi, both of Tokyo, and Jun Hattori, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,459

Claims priority, application Japan, Mar. 4, 1983, 58-35354

Int. Cl.⁴ G02B *9/64, 15/15*

U.S. Cl. 350—427 **2 Claims**



1. A zoom lens comprising:

a first lens component of positive refractive power, a second lens component of negative refractive power, a third lens component of positive refractive power and a fourth lens component for forming an image, in the order from the front,

zooming being performed by moving said first lens component and said third lens component while said second lens component being held stationary, wherein when zoomed to the telephoto position, each of said first and said third lens components lies in more front a position than when in the wide angle position, and satisfying the following conditions

$$0.45 < \frac{fI}{fT} < 0.75$$

$$0.1 < \frac{|fII|}{fT} < 0.23$$

$$0.2 < \frac{fIII}{fT} < 0.35$$

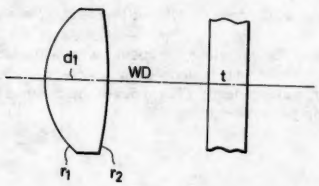
wherein fI, fII and fIII denote the focal lengths of said first, said second and said third lens components respectively, and fT the longest focal length of the entire system.

4,571,034

LENS SYSTEM FOR OPTICAL RECORDING TYPE DISKS

Toru Nakamura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,875
Claims priority, application Japan, Aug. 5, 1982, 57-135660
Int. Cl.⁴ G02B *13/08*
U.S. Cl. 350—432 **8 Claims**



1. A lens system for optical recording type disks comprising one lens element with the entrance surface formed as a convex surface, both surfaces of said lens element being formed as aspherical surfaces expressed by the formula of aspherical surface including at least the term proportional to the sixth power of the incidence height as shown below and said lens system being arranged to fulfill the conditions (1), (2) and (3) shown below:

$$x = \frac{y^2}{r + r\sqrt{1 - p\left(\frac{y}{r}\right)^2}} + Ey^4 + Fy^6 + Gy^8 + \ldots$$

$$-2.2 < p_1 < 1.1 \quad (1)$$

$$0.6 < \frac{n_1 - 1}{r_1} f < 1.4 \quad (2)$$

$$0.8 < p_2 < 1.2 \quad (3)$$

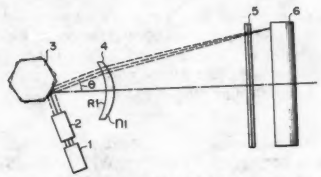
where, reference symbol x represents the distance from a point on the lens surface to the tangential plane which is tangential to said surface at the vertex thereof, reference symbol y represents the incidence height, reference symbol r represents the radius of curvature of the vertex portion of the surface, reference symbol r_1 represents the radius of curvature of the vertex portion of the first surface, reference symbol p represents the coefficient of cone, reference symbol p_1 represents the coefficient of cone of the first surface, reference symbol p_2 represents the coefficient of cone of the second surface, reference symbols E, F, G, etc., respectively represent coefficients of aspherical surface in the terms proportional to the fourth power, sixth power, eighth power etc. of the incidence height, reference symbol n_1 represents the refractive index of the lens element, and reference symbol f represents the focal length of the lens system for optical recording type disks.

4,571,035

TWO-ELEMENT Fθ LENS GROUP CAPABLE OF CORRECTING LEANING OF DEFLECTING PLANE

Nobuo Sakuma, Inagi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,697
Claims priority, application Japan, Nov. 28, 1981, 56-191181
Int. Cl.⁴ G02B *3/02, 27/17*
U.S. Cl. 350—433 **7 Claims**



1. For use in an optical scanner in which a beam which is elliptical in section and having a principal axis substantially parallel to a deflecting plane and adapted to be focused in a direction orthogonal to the principal axis is caused to be incident on a deflection unit so as to be focused adjacent to a deflecting point in one direction and in which the beam is deflected by the deflection unit at a substantially uniform angular rate to scan a surface; a two-element lens group capable of correcting leaning of a deflecting plane and for focusing a beam onto a surface being scanned as it is deflected by the deflection unit so as to scan the surface substantially at a uniform rate, comprising:

a meniscus single lens disposed alongside the deflection unit, the meniscus single lens having an fθ characteristic, having a positive power and having a concave surface thereof directed toward the deflecting point, and

a cylindrical lens disposed alongside the surface being scanned and having a positive power in a plane which is perpendicular to the deflecting plane wherein the following criteria is satisfied:

$$1.6 \leqq n_1 \leqq 2.0 \quad (i)$$

$$-15 \leqq R_1/f_1 \leqq -1.7 \quad (ii)$$

$$f_2/f_1 \leqq 0.3 \quad (iii)$$

where f_1 represents the focal length of the meniscus single lens, n_1 the refractive index of the meniscus single lens, R_1 the radius of curvature of a surface of the meniscus single lens which is directed toward the deflection unit and f_2 the focal length of a surface of the cylindrical lens which has a refracting power.

4,571,036

REFLECTING TELESCOPE WITH CORRECTING LENS

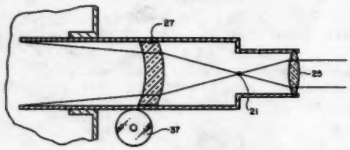
Rolin J. Gebelein, 291 Martin Rd., Santa Cruz, Calif. 95060, and David Shafer, Fairfield, Conn., assignors to Rolin J. Gebelein, Santa Cruz, Calif.

Division of Ser. No. 316,134, Oct. 29, 1981, Pat. No. 4,477,156.
This application Oct. 15, 1984, Ser. No. 660,916
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.⁴ G02B *17/08, 23/06*
U.S. Cl. 350—503 **8 Claims**

1. A correcting lens system for use with a telescope having a reflecting mirror and having an eyepiece with spherical aberration, comprising:

a meniscus lens having a concave surface and a convex surface; and

mounting means for holding said meniscus lens on an optic axis of said telescope with said concave surface of said meniscus lens closer to said mirror than said convex surface, for providing a distance between said meniscus lens and said eyepiece which will correct said spherical aberration of said eyepiece, and for moving said meniscus lens along said optic axis to also correct coma aberration of said reflecting mirror.

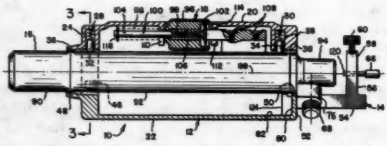


4,571,037

FIBER OPTIC MICROSCOPE WITH ADJUSTABLE TUBE ASSEMBLY

Edward N. Esmay, Webster, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 14, 1983, Ser. No. 550,837
Int. Cl.[4] G02B *21/00*
U.S. Cl. 350—507 **6 Claims**



1. A compact portable microscope, comprising:

a housing;

an optical tube assembly supported within said housing, having an eyepiece and an objective positioned along an optical axis;

adjusting means supported by said housing and coupled to said optical tube assembly for accomplishing focussing adjustments of said optical tube assembly in directions along said optical axis; and

means for pivoting said optical tube assembly relative to said housing including a spring biased pad member and at least one stationary pad mounted to said housing and engaging said optical tube assembly, and means operably communicating with said housing for moving said optical tube assembly relative to said housing to thereby adjust said objective relative to the position of a specimen being examined.

4,571,038

BINOCULAR ZOOM MICROSCOPE

Geza J. Jako, 169 E. Emerson St., Melrose, Mass. 02176

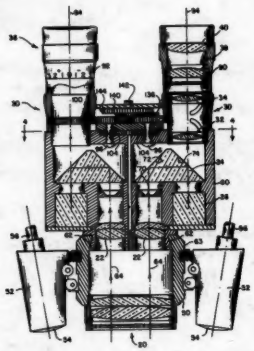
Filed Nov. 8, 1982, Ser. No. 439,839
Int. Cl.[4] G02B *21/22*
U.S. Cl. 350—515 **6 Claims**

1. A binocular zoom microscope having a collimating lens and a pair of monocular systems in parallel optical alignment with the collimating lens,

each monocular system having an objective lens, a zoom magnification changer and a compound eyepiece,

the zoom magnification changer of each monocular system being located adjacent the compound eyepiece and on the same axis, the objective lens being located on an axis spaced from and parallel to the eyepiece axis,

means for pivoting each monocular system about the axis of its objective lens to change the distance between the compound eyepieces to accommodate the interpupillary distance of the viewer without line of sight convergence and



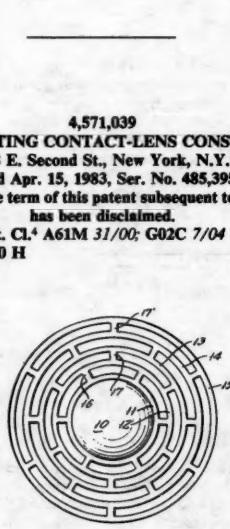
gear means for operating the zoom magnification changers of both monocular systems simultaneously in zoom fashion and independently of changes in the distance between the compound eyepieces.

4,571,039

EYE-MEDICATING CONTACT-LENS CONSTRUCTION

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Filed Apr. 15, 1983, Ser. No. 485,395
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.[4] A61M *31/00*; G02C *7/04*
U.S. Cl. 351—160 H **20 Claims**



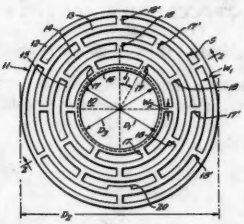
1. A contact lens assembly adapted for self-adherent removable mounting to the cornea of an eye, comprising a circular lens element, and eye-medicating haptic means peripherally engaging and mounting said element, said haptic means being a fenestrated annulus of sheet material and being of such compliant action as to deform in continuous smooth conformance to the surface curvature of the cornea and to adhere thereto solely through contact with natural moisture of the surface of the cornea, and said annulus being adapted to carry medication releasable on contact with such moisture.

4,571,040

CONTACT LENS AND HAPTIC

Stanley Poler, New York, N.Y., assignor to Lynell Medical Technology, Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 124,941, Feb. 26, 1980, Pat. No. 4,377,329. This application Feb. 17, 1983, Ser. No. 467,436
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—160 R 22 Claims



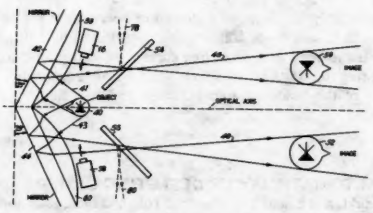
1. A contact-lens assembly adapted for removable mounting to the cornea of an eye, comprising a circular lens element, and haptic means peripherally connected to said lens element, said haptic means including an integrally formed axially compliant fenestrated annulus having an outer perimeter which is circumferentially continuous, said annulus having plural angularly and radially directed connections between said perimeter and said lens element.

4,571,041

THREE DIMENSIONAL PROJECTION ARRANGEMENT

Tad J. Gaudyn, 112 Meserole Ave., Brooklyn, N.Y. 11222

Division of Ser. No. 341,613, Jan. 22, 1982, Pat. No. 4,492,442, which is a continuation-in-part of Ser. No. 82,211, Oct. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 917,400, Jun. 20, 1978, abandoned. This application Oct. 25, 1984, Ser. No. 664,861
Int. Cl.[4] G03B *21/00*
U.S. Cl. 353—10 7 Claims



1. A three-dimensional projection arrangement for projecting dual three-dimensional images into space for viewing by an audience, comprising:

(a) an object for which dual three-dimensional images are projected;

(b) dual light sources for illuminating said object;

(c) dual adjacent lens means each comprising a multiple refracting type lens having multiple focal lengths, said dual lens being positioned to receive reflected light from said object; and

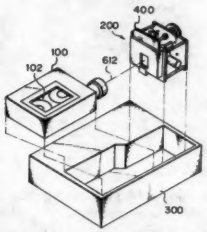
(d) dual reflecting mirror means movably located behind said dual lens means, said mirror means being adjustable relative to the lens and adapted for receiving an image of said object from said lens means and reflecting said image back through said lens means, whereby said dual lens means and said dual mirror means receive light rays from the illuminated object and form dual three-dimensional images projected into space for viewing by the audience.

4,571,042

DISK FILM PROJECTOR

Yoshiaki Nakayama, and Takao Kiuchi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1984, Ser. No. 644,952
Claims priority, application Japan, Aug. 29, 1983, 58-156338
Int. Cl.[4] G03B *23/10*
U.S. Cl. 353—110 3 Claims



1. A disk film projector wherein one of a plurality of frames of image recorded on a rotary disk of film having a central engaging part is selectively placed at a projecting position to reproduce selected one of said frames in the form of a visible images, comprising:

driving means including a rotary driving shaft having a forward end thereof engageable with the engaging part of said disk of film;

means for holding said rotary film in a plane substantially normal to said rotary driving shaft upon insertion of said rotary film thereinto, said rotary disk being introduced, and taken out of, the projector in a direction substantially normal to said rotary driving shaft;

means for normally urging said rotary driving shaft in a direction such that said driving shaft is engaged with the engaging part of the rotary disk held by said holding means; and

means for locking said rotary driving means at a position spaced from said rotary disk when said rotary driving shaft is, in response to manual operation thereon, shifted against said urging means and away from said rotary disk.

4,571,043

DUSTPROOFING DEVICE FOR THIN VERTICALLY DISPOSED CAMERA

Haruo Kobayashi, Sakai, and Hiroshi Ueda, Saidaiji, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 16, 1983, Ser. No. 533,377
Claims priority, application Japan, Sep. 24, 1982, 57-167407
Int. Cl.[4] G03B *17/12*
U.S. Cl. 354—121 13 Claims

1. In a thin vertically disposed camera including:

a body having a pair of parallel longer edges, a pair of parallel shorter edges, and a front wall delineated by said body longer and shorter edges, said front wall having a first window delineated by a pair of longer edges parallel to said body longer edges and a pair of shorter edges parallel to said body shorter edges;

a protruding portion formed on and protruding from said front wall and having a second window therein;

a picture-taking lens located in said body and accommodated by said protruding portion and having an optical axis traversing said second window perpendicular to said front wall; and

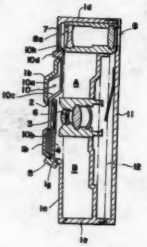
a viewfinder optical system having an optical axis transversing said first window perpendicular to said front wall,

an improved dustproofing mechanism comprising:

a first cover member located between said first window and said viewfinder optical system;

a second cover member located between said second window and said picture-taking lens;

means connecting said first and second cover members;



support means movably supporting said first and second cover members for movement in a direction parallel to said body shorter edges between an opened position opening said windows and a closed position closing said windows; and

a manually operable projection provided on said first cover member and protruding through said first window.

4,571,044

FILM FEED CONTROL DEVICE IN A CAMERA

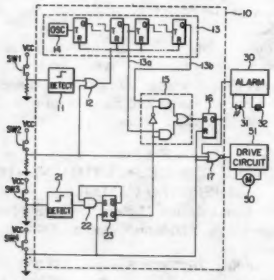
Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,550

Claims priority, application Japan, Apr. 23, 1984, 59-59595[U]

Int. Cl.⁴ G03B *1/18*

U.S. Cl. 354—173.11 **2 Claims**



1. A still camera provided with an electric motor for rotating a spool for taking up a roll film drawn out from a cartridge loaded into the camera, comprising:

(a) trigger means for starting said electric motor to start the rotation of said spool;

(b) means responsive to the movement of said roll film resulting from the rotation of said spool to generate a reset signal at a predetermined interval while said roll film is moved;

(c) means provided so as to be driven by said roll film and detecting that the movement of said roll film has been actually started and generating a detection signal;

(d) time counting means adapted to start time counting in synchronism with said trigger means and reset by said reset signal, said time counting means having a first delay time longer than the interval of said reset signal and a second delay time longer than said first delay time, said time counting means generating a time counting output after the lapse of said second delay time before said detection signal is generated, and generating a time counting output after the lapse of said first delay time after said detection signal has been generated; and

(e) means responsive to said time counting output to interrupt the operation of said electric motor for rotating said spool.

4,571,045

LIGHT-INTERCEPTING BLADE FOR A LIGHT CONTROL DEVICE

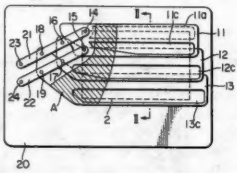
Kimio Uematsu, Tokyo, Japan, assignor to Nippon Kagaku K.K., Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,925

Claims priority, application Japan, Feb. 1, 1982, 57-11389[U]

Int. Cl.⁴ G03B *9/40*

U.S. Cl. 354—245 **5 Claims**



1. In a light control device including a planar light-intercepting blade disposed across an optical path of an optical device and driving means for holding said light-intercepting blade and moving said light-intercepting blade in the direction of the surface thereof, said light control device being adapted to control the quantity of light passing along said optical path, the improvement residing in that said planar light-intercepting blade includes a first area having a substantially constant thickness, a second area surrounded by said first area and formed more thinly than said first area, and a coupling portion provided in said first area and coupled to said driving means, said first and second areas being formed so that the proportion of said blade occupied by said second area relative to said first area in the direction of movement of said light-intercepting blade gradually increases in a direction away from said coupling portion, said second area being constituted by a number of recesses formed in at least one surface of said planar light-intercepting blade, and said first area being constituted by material of the blade located between and surrounding said recesses.

4,571,046

AUTOMATIC FOCUS DETECTING CAMERA

Koji Suzuki, and Eiichi Tano, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,172

Claims priority, application Japan, Mar. 31, 1983, 58-56481

Int. Cl.⁴ G03B *17/00*

U.S. Cl. 354—400 **3 Claims**

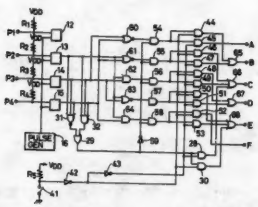
1. In an automatic focus detecting camera having a focus detecting circuit operating in response to data specifying a full-aperture f-number of a photographing lens used with said camera, a device for supplying said data representing said full-aperture f-number comprising:

a switch for manually instructing a full-aperture f-number;

a plurality of switch contact pins provided on a surface of a lens mount of said camera, said switch pins being positioned to be operated by corresponding indicating pins on a mount of a lens attached to said lens mount of said

camera, said switch pins providing a first signal state in the presence of a corresponding indiciating pin and a second state in the absence of a corresponding indicating pin, said indicating pins being provided on said lens in a pattern indicative of a full-aperture f-number of said lens; and

decoding circuit means for decoding signals provided by said switch pins to produce said data representing said



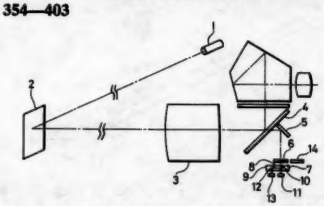
full-aperture f-number of said lens, said decoding circuit means comprising means for determining whether said lens has any indicating pins and means for producing as said data decoded data of said switch contact pins when said detecting means detects the presence of at least one indicating pin and data specified by said manually operated switch when said detecting means detects no indicating pin.

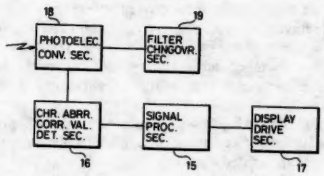
4,571,047

TTL FOCUS DETECTING DEVICE FOR SINGLE-LENS REFLEX CAMERA

Isamu Hirai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,165
Claims priority, application Japan, Jun. 22, 1983, 58-112523
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **6 Claims**





1. A focus detecting device for a camera, comprising:

a source of infrared light directed on an object;

means for transmitting a selected one of said infrared beam and a visible beam passing through a photographing lens of said camera, said infrared beam being emitted and transmitted when a brightness of an image viewed through said photographing lens is below a predetermined value and said visible beam being transmitted when said brightness of said image is above said predetermined value;

means for producing a focus detection signal in response to light from the emitted one of said infrared beam and said visible beam reflected by said object through said photographing lens; and

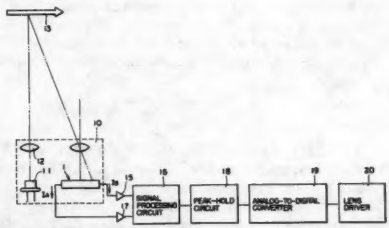
means for correcting said focus detection signal when said infrared beam is emitted so that a focused position indicated by said focus detection signal when said infrared beam is emitted coincides with a focused position indicated by said focus detection signal when said visible beam is emitted.

4,571,048

AUTOMATIC FOCUSING SYSTEM OF PHOTOGRAPHIC CAMERA

Saburo Sugawara, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,551
Claims priority, application Japan, Dec. 13, 1982, 57-216856
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 **8 Claims**



7. An automatic focusing system of a photographic camera comprising:

a distance measuring device to continuously produce an analog distance signal representative of distance from a film plane to subjects;

means for driving said distance measuring device to scan a certain predetermined zone within a range to be Photographed, and to measure the distance between the film plane and each of the scanned subjects;

an analog peak and hold memory for detecting and holding a value of said distance signal appearing during the scanning and corresponding to the nearest subject; and

means responsive to said value of said distance signal held by said memory for moving a photographic lens of the camera to focus the image of the nearest subject on said film plane.

4,571,049

PHOTOGRAPHIC CAMERA OF MULTIPLE SPOT PHOTOMETRY TYPE

Katsuhiko Tsunefuji, and Masafumi Yamasaki, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1984, Ser. No. 571,378
Claims priority, application Japan, Mar. 17, 1983, 58-45088
Int. Cl.[4] G03B *7/08*
U.S. Cl. 354—410 **12 Claims**

1. A photometric camera of the multiple spot photometry type comprising:

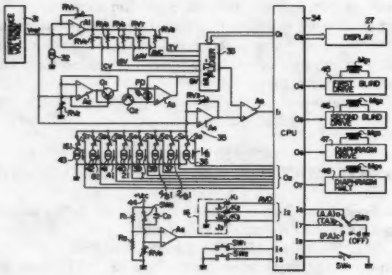
photometric means in which photometry is effected by means of a single photoelectric transducer element;

storage means having a plurality of storage locations for sequentially receiving information representing the brightness of an object being photographed at desired

spots to be determined and for storing such information at different storage locations in said storage means;

update means operative whenever the number of information from the photometric means is received reaches a given number to substitute the latest brightness information for the oldest information which has previously been received and stored in a sequential manner; and

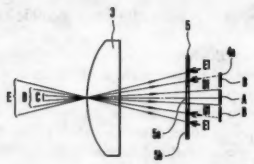
processing means for performing a given arithmetic operation utilizing the stored brightness information derived from the photometric means for exposure control or display.



4,571,050
LIGHT MEASURING DEVICE FOR CAMERA

Kikuo Momiyama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,412
Claims priority, application Japan, May 20, 1983, 58-88967
Int. Cl.[4] G03B 7/099
U.S. Cl. 354—429 7 Claims



1. A light measuring device for a camera arranged to permit shifting of a photometric range thereof, comprising:

a photo-sensitive element which is divided into two regions including a center part and a peripheral part; and

a diffusing member divided into a center part and a peripheral part which are of different diffusing characteristics, said diffusing member being disposed in front of said photosensitive element.

4,571,051
DISPLAY DEVICE OF A CAMERA

Kazuyuki Kazami, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

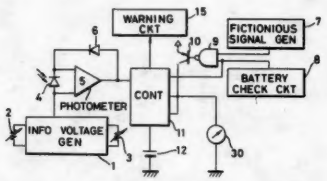
Filed Feb. 1, 1985, Ser. No. 697,460
Claims priority, application Japan, Feb. 6, 1984, 59-18479; Feb. 6, 1984, 59-14092[U]
Int. Cl.[4] G03B 17/20
U.S. Cl. 354—468 6 Claims

1. A camera having means for measuring the brightness of an object to be photographed and generating a measurement signal corresponding to said measured brightness of the object to be photographed, and means for generating a photographing information signal corresponding to photographing information different from said brightness of the object to be photographed, said camera including:

(a) display means;

(b) means for inputting said measurement signal to said display means, said display means effecting a display in accordance with said measurement signal;

(c) said inputting means including changeover means responsive to the generation of said photographing information signal to input said photographing information signal instead of said measurement signal to said display means; and

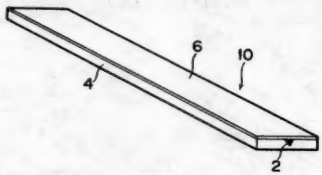


(d) means for clamping the display of said display means within a predetermined range in accordance with the stoppage of the generation of said photographing information signal.

4,571,052
ELECTRIC FIELD TRANSFER METHOD AND APPARATUS

Masaharu Shirai, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,958
Claims priority, application Japan, May 31, 1984, 59-109738
Int. Cl.[4] G03G 15/16
U.S. Cl. 355—3 TR 8 Claims



1. An electric field transfer method of transferring toner image formed on a surface of an electrostatic latent image bearing member to a sheet of toner receiving member, the latent image bearing member having a conductive substrate laminated thereto, comprising:

(a) laying an elongated conductive member on a surface of a substrate having volume resistivity of about 10^6 to $10^{16}\Omega$.cm and surface resistivity of about 10^6 to $10^{16}\Omega$, said elongated conductive member having a cylindrical or knife edge-shaped top surface whose radius of curvature is less than about 3 mm;

(b) disposing the surface of said substrate in close proximity with the surface of said latent image bearing member having a toner image formed thereon;

(c) passing a sheet of toner receiving member between the surface of said latent image bearing member having the toner image formed thereon and the surface of said substrate having the elongated conductive member laid thereon; and

(d) applying a high DC voltage between the elongated conductive member and the conductive substrate of said latent image bearing member thereby forming a narrow electric field between the surface of said latent image bearing member and the elongated conductive member whereby the toner image is transferred from the surface of said latent

image bearing member to said sheet of toner receiving member.

4,571,053

IMAGE FORMING APPARATUS

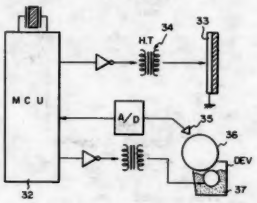
Nobuhiro Kasama, Yokohama; Mitsuru Kurata, Kawasaki; Hiroshi Tanioka, Tokyo; Tadashi Yamakawa, Yokohama; Yutaka Inoue, Urawa; Masao Hosaka, Sagamihara, and Toshiaki Yagasaki, Hino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1984, Ser. No. 651,779

Claims priority, application Japan, Sep. 22, 1983, 58-174374; Sep. 22, 1983, 58-174375

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **19 Claims**



1. An image forming apparatus comprising:

a light source;

a photosensitive member adopted to be illuminated by a light from said light source;

a liquid crystal having a liquid crystal display panel for displaying an image, and for controlling illumination and non-illumination of the light to said photosensitive member to form an image on said photosensitive member;

detection means for detecting an image reproduction ability of said photosensitive member to set an image forming condition on said photosensitive member; and

setting means for setting said liquid crystal display panel to a predetermined condition to allow detection by said detection means.

4,571,054

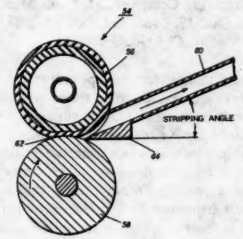
POST-FUSER COPY SHEET DECURLER

Edward F. Bowler, Jr., Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 500,121

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **4 Claims**



1. In a xerographic reproducing apparatus including a heat and pressure roll fuser for fixing toner images to copy sheets, the improvement comprising:

post-decurling means for removing curl induced into said copy sheets by a pressure roll forming a part of said roll fuser;

said post-decurling means comprising means for separating copy sheets from said pressure roll, said separating means being effective to bend said copy sheets in the direction opposite to the direction of bend induced by said pressure roll;

means associated with said separating means for receiving said copy sheets and for maintaining said sheets in the condition in which they leave said separating means; and

said separating means comprising a plurality of stripper fingers contacting said pressure roll and said maintaining means comprising a guide positioned adjacent to said stripper fingers and in line therewith, each of said stripper fingers being oriented at an acute angle of approximately 35 degrees with respect to a plane tangent to said pressure roll, said plane coinciding with the plane of said copy sheets prior to the curl being induced therein by said pressure roll, said guide being disposed at the same angle as said stripper fingers, the plane occupied by said stripper fingers and said guide being such that said copy sheets are caused to travel in a generally upward direction.

4,571,055

TRANSPORT ITEM DETECTING ARRANGEMENT

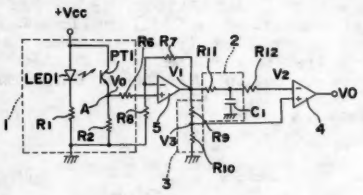
Haruo Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1984, Ser. No. 681,149

Claims priority, application Japan, Dec. 17, 1983, 58-238411; Dec. 17, 1983, 58-238412; Dec. 17, 1983, 58-238413

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **7 Claims**



1. A transport item detecting arrangement which comprises a light emitting means and a light receiving means disposed to confront a transport passage as a sensor means for detection of an item to be transported along said transport passage, the improvement comprising means for comparing a signal responding to an output of said sensor means with an integrated signal from a circuit which outputs an integrated signal of said sensor means output, thereby to employ a signal based on result of said comparison as a signal indicative of presence or absence of the item to be transported.

4,571,056

FIXING DEVICE

Tatsuo Tani, Urayasu, and Yasunori Kawaishi, Chiba, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 19, 1984, Ser. No. 590,721

Claims priority, application Japan, Mar. 18, 1983, 58-044362; Mar. 24, 1983, 58-049530

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—3 FU **7 Claims**

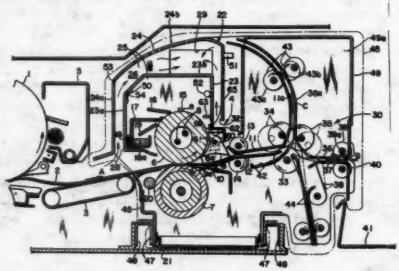
1. A fixing device comprising:

a pair of fixing rollers including a heating roller and a pressure applying roller maintained in pressing engagement with each other to allow a toner image bearing recording sheet to pass therethrough;

at least one stripping claw having a forward end arranged such that said forward end is in contact with the heating

roller to strip a recording sheet off the heating roller when the recording sheet adheres to the heating roller;

heat insulating means arranged in a manner to enclose at least a portion of the pair of fixing rollers, said heat insulating means including at least one portion movably supported by a fixed portion of said heat insulating means and supporting said stripper claw for movement;



a spring mounted between said heat insulating means and stripping claw for biasing a forward end of the stripper claw to press against the heating roller; and

a stopper attached to the heat insulating means for restricting the range of movement of the stripper claw toward the heating roller.

4,571,057

TRANSFER MEDIUM SEPARATION IN A RECORDING APPARATUS

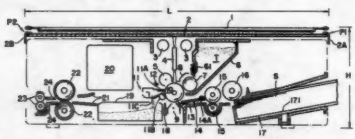
Yutaka Koizumi, Kawasaki, and Eiichi Akutsu, Ichikawa, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 9, 1983, Ser. No. 493,007

Claims priority, application Japan, May 12, 1982, 57-79627

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 R **7 Claims**



1. A recording apparatus comprising:

an endless image forming member driven to rotate in a predetermined direction to pass through a transfer station;

image forming means for forming an image on said endless image forming member;

transporting means for transporting transfer mediums one by one through said transfer station where said image formed on said endless image forming member is transferred to the transfer medium which is brought into contact with said endless image forming member at said transfer station, said transporting means including stiffness adjusting means for adjusting the stiffness of said transfer mediums which are to be brought into contact with said image forming member at said transfer station so that a uniform separating characteristic is obtained irrespective of the degree of stiffness of said transfer mediums before adjustment; and

said endless image forming member having a radius of curvature at said transfer station which is small enough for said transfer medium to separate away from said endless image forming member by its own stiffness after passing through the transfer station.

4,571,058

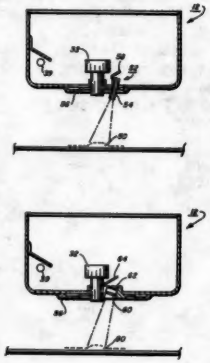
FLASH ILLUMINATION AND OPTICAL IMAGING SYSTEM

Richard F. Lehman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1984, Ser. No. 669,490

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 R **5 Claims**



1. A flash illumination and optical imaging system for reproducing documents on an object plane onto a photoreceptor belt member comprising, in combination:

a transparent object plane for supporting original documents to be reproduced;

a document illumination housing positioned beneath said object plane;

an illumination means positioned interior of said housing and adapted to be periodically energized to provide a generally uniform level of illumination at said object plane;

a projection lens mounted in the bottom surface of said housing opposite said object plane, said lens adapted to project an image of said document onto said photosensitive belt member, said projected image containing a superimposed image of the projection lens as reflected from said object plane; and

at least one optical means for directing a portion of the illumination produced within said housing onto the area of said belt member conforming to the area of said negative lens image so as to reduce the charge on said lens image.

4,571,059

APPARATUS FOR TRANSFERRING IMAGES OF CONDUCTIVE TONER POWDER

Charles P. Huss, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 17, 1983, Ser. No. 542,887

Int. Cl.[4] G03G *15/16*

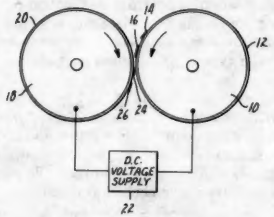
U.S. Cl. 355—3 TR **2 Claims**

1. Toner powder image transfer apparatus for transferring images of electronically conductive toner powder from the surface of a layer carried on the outer surface of a first movable, electrically conductive, cylindrical member including:

a second movable, electrically conductive, cylindrical member having a dielectric material at its outer surface for receiving the transferred toner image, said second member positioned from the first member to provide an air space that is at least as great as the extreme dimension of the largest toner powder particles with the first member positioned so the layer carried by the first member is parallel to said outer surface of said second member at said air space, and

means for applying a d.c. voltage continuously between said

first member and said second member for transferring toner powder from the first member at said air space to



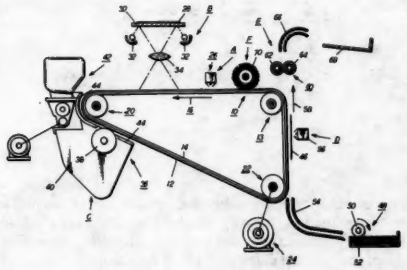
said dielectric material at the outer surface of said second member during movement of the first member and said second member.

4,571,060

HOUSING SEAL

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,270
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **46 Claims**



1. An apparatus for sealing a housing to prevent the escape of toner particles therefrom, including:

a region of the housing adapted to be sealed; and

means, disposed on said region, for capturing the toner particles, said capturing means securing the toner particles and inducing the toner particles to soften and become tacky so that other toner particles stick to the tacky toner particles.

4,571,061

IMAGE FORMING APPARATUS

Takenori Osanai, Ebina, and Hideshi Oushiden, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 11, 1983, Ser. No. 522,211
Claims priority, application Japan, Aug. 19, 1982, 57-143714
Int. Cl.[4] G03B *15/00*
U.S. Cl. 355—8 **13 Claims**

1. An image forming apparatus for obtaining any copy ratio within a predetermined continuously varying range of copy ratios comprising:

a main body;

an original table, connected to said main body, for receiving an original placed thereon;

an image carrier for forming an image of said original thereon;

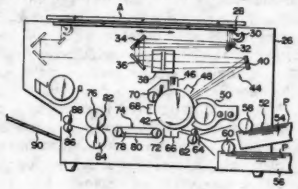
illuminating means for illuminating said original on said original table,

optical means, disposed in said main table, for directing light reflected to said original along an optical axis to said image carrier, said optical means including a single focus lens movable along said optical axis and having a fixed focal length (f) for focusing said reflected light on said image carrier;

a first motor, disposed in said main body, for optically scanning said original through relative movement of said original and said illuminating means;

a second motor, disposed in said main body, for varying a distance (a) from said original to said lens;

a third motor for moving said single focus lens to vary a distance (b) from said lens to said image carrier;



first means, connected to said main body, for inputting data specifying a copy ratio which is within said range of copy ratios;

second means for causing said second motor and said third motor to change the distances (a) and (b) to make a ratio (b/a) coincident with said specified copy ratio data input from said first means satisfying an equation $1/a+1/b=1/f$, and for causing said first motor to provide said relative movement at a speed in accordance with said specified copy ratio data, and for causing said third motor to move said single focus lens in accordance with said specified copy ratio data; and

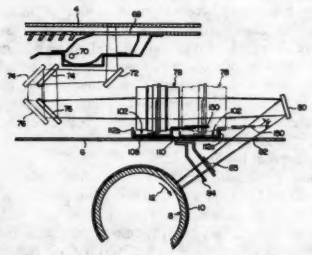
a fourth motor for driving said image carrier.

4,571,062

ELECTROSTATIC COPYING PROCESS AND APPARATUS

Masahiro Yoshioka, Matsubara; Masahiro Murakami, Shijonawate; Yoichiro Irie, Suita; Tsugio Nakanishi, Osaka; Eiji Tsutsui, Amagasaki; Noriyuki Iwao, Kobe; Junichi Hirobe, Osaka, and Takahiro Wakikaido, Yao, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Division of Ser. No. 424,943, Sep. 27, 1982. This application May 9, 1985, Ser. No. 732,326
Claims priority, application Japan, Nov. 30, 1981, 56-192395
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—8 **4 Claims**



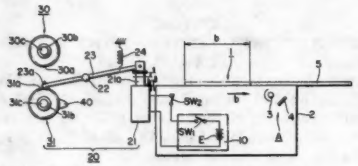
1. In an electrostatic copying apparatus adapted for copying at variable ratios, an optical device for performing slit expo-

sure scanning of an original document and projecting its image onto a photosensitive member, said optical device comprising a document illuminating lamp for illuminating a document to be copied and a lens for projecting the image of the document onto the photosensitive member, said lens being adapted to be selectively held either at an equal scale position for projecting the image of the document on a substantially equal scale onto the photosensitive member or predetermined ratio position spaced a predetermined distance from said equal scale position in a direction oblique to the optical axis at a predetermined angle for projecting the image of the original document at a predetermined ratio onto the photosensitive member, the slit exposure scanning being performed at a speed variable according to the ratio of copying with a slit exposure width regulated between the lens and the photosensitive member; characterized in that the distribution of the illuminance of the document illuminating lamp in the widthwise direction is prescribed such that when the lens is held at the equal scale position, the decaying characteristics of the lens in the widthwise direction are offset to render the illuminance distribution in the widthwise direction on the photosensitive member substantially uniform, and when the lens is held at the predetermined ratio position, an exposure adjusting plate is positioned partly in a light path leading from the lens to the photosensitive member, said exposure adjusting plate being adapted for compensating variations in illuminance on the photosensitive member which are ascribable to the displacement of the optical axis in the widthwise direction caused by the movement of the lens from the equal scale position to the predetermined ratio position and to variations in the degree of focusing on the photosensitive member caused by the change of the projecting ratio.

4,571,063
RECORDING APPARATUS

Tatsumi Horiuchi, Hino; Takashi Tamura, Higashimine, and Tatufumi Kusuda, Hachioji; all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,602
Claims priority, application Japan, Aug. 24, 1982, 57-146606
Int. Cl.⁴ G03G *15/04*
U.S. Cl. 355—8 **10 Claims**

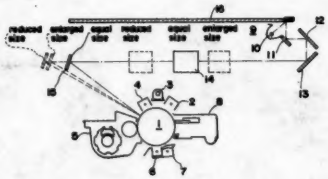


1. In a recording apparatus comprising:
a movable member for exposing an original to light and for scanning said original; and
a power transmission device for reciprocally moving said movable member, said power transmission device comprising a plunger type solenoid having a plunger and a coil, a first clutch means coupled to said plunger for controlling forward movement of said movable member in response to an operation of said plunger type solenoid to a first state, and a second clutch means coupled to said plunger for controlling backward movement of said movable member in response to said plunger type solenoid being in a second state;
the improvement wherein:
said plunger of said solenoid is movable relative to said solenoid coil between first and second positions, said first position being an attracted position in which said solenoid coil is energized and said plunger is attracted thereto, and said second position being beyond a limit position of attraction whereat said plunger is not attracted to said solenoid coil upon energization of said solenoid coil;
said plunger assuming said first position when said solenoid is in one of its first and second states, and said plunger assuming said second position when said solenoid is in the other of its first and second states; and
said power transmission device further comprises:
a movable cam means coupled to said second clutch means for moving said plunger from said second position thereof to a third position intermediate said first and second positions and in an area where said plunger can be attracted by said plunger type solenoid upon energization of said solenoid coil;
a recording start switch; and
a limit switch arranged for detecting a forward movement limit position of said movable member and for causing said power transmission device to deactivate said second clutch means responsive to said movable member reaching said forward movement limit position.

4,571,064
OPTICAL ELEMENT POSITIONING APPARATUS FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masamichi Hayashi, Aichi, and Yukio Tokura, Toyohashi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1984, Ser. No. 596,824
Claims priority, application Japan, May 19, 1983, 58/75082[U]
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—8 **4 Claims**

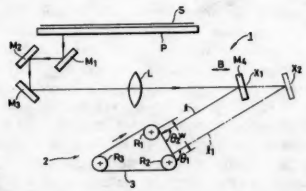


1. An optical element positioning apparatus for use in a variable magnification copying machine which has movable optical members for scanning an original, a lens for projecting an image of the original and a mirror for directing the image of the original from the lens toward a photosensitive medium, the apparatus comprising;
means for supporting the lens continuously shiftably along the optical path from the optical members,
means for suporting the mirror continuously shiftably along the optical path from the lens to make the length of the optical path equal to the total conjugate distance corresponding to a selected magnification and pivotally movable relative to the optical path to make the image of the original incident on the photosensitive medium always at a definite position, said mirror supporting means having a shiftable member shiftable along the optical path from the lens, a holding member which holds the mirror and is supported pivotally on said shiftable member, an eccentric cam in contact with said shiftable member to shift the shiftable member, and a fixed position slanting cam in bearing contact with a portion of the holding member to move the mirror pivotally,
a drive source,
first means for transmitting a drive force of the drive source to the lens to locate the lens in a position corresponding to a selected magnification, and
second means for transmitting the drive force of the drive source to said eccentric cam to give to the mirror supporting means a position and an angle corresponding to the selected magnification, whereby the position of the lens and the mirror can be changed substantially continuously to a position of newly selected magnification.

4,571,065
SCALE FACTOR CHANGING MECHANISM FOR COPYING MACHINE

Keiryo Yasuda, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,820
Claims priority, application Japan, Dec. 1, 1982, 57-209227
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—11 5 Claims

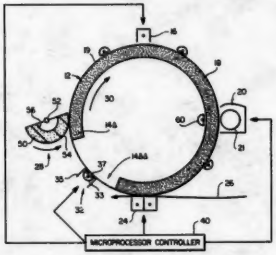


1. A copying machine comprising:
a platen having a surface supporting an original to be copied;
a lens for focusing an image of said original on to a photosensitive member;
a series of mirrors for reflecting said image on to said lens, said mirrors at fixed positions in relation to said lens and to one another,
one movable mirror arranged between said lens and said photosensitive member, said lens movable in parallel with the direction of the optical axis of said lens, and
said photosensitive member comprising a flat belt employed as an exposure projection surface.

4,571,066
ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING METHOD OF FORMATION OF TONER TRANSPORT GRID USED AS A PART OF DRUM CLEANING SYSTEM

Elden R. Morrison, Branchport, N.Y., assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 516,954, Jul. 25, 1983. This application Oct. 24, 1984, Ser. No. 664,487
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 5 Claims

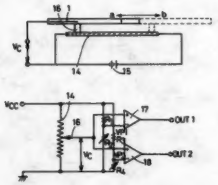


1. A method of electrophotographically copying information from a given master, comprising the steps of:
(a) providing a rotatable drum having a photosensitive outer circumferential surface and means for rotating the drum about its longitudinal axis and along a fixed annular path in a controlled fashion;
(b) forming a given electrostatic latent image corresponding to said information on a first circumferential image segment of said drum surface;
(c) applying toner from a given toner storage area onto the image bearing first segment of said drum surface in a way which develops said image;
(d) providing a transfer corotron actuatable to electrostatically charge a support surface to attract the toner comprising said developed image;
(e) transferring said applied toner from said segment of said drum to said support surface to form a copy of said image;
(f) after the application of toner onto said first segment of said drum surface bearing said given image and the subsequent transfer of said applied toner onto said support surface to produce at least one copy, actuating said transfer corotron to charge a second, non-image segment of said drum surface with a toner attracting charge level and polarity grid at a first point on said annular path;
(g) providing a pre-clean lamp for uniformly discharging the image bearing first segment of the drum surface, and repetitively actuating said pre-clean lamp to selectively discharge band portions of said charged second non-image segment to define a charged toner transport grid in said second segment;
(h) moving any of said applied but untransferred toner from said first segment to said second segment;
(i) rotating said drum in a way which moves said second segment from said first point to a second point on said annular path; and
(j) removing the toner from said second segment of said drum surface at said second point.

4,571,067
DETECTING DEVICE FOR OPTICAL SCANNING SYSTEM POSITION SUITABLE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Haruo Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1983, Ser. No. 542,207
Claims priority, application Japan, Oct. 22, 1982, 57-186358
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—14 SH 7 Claims

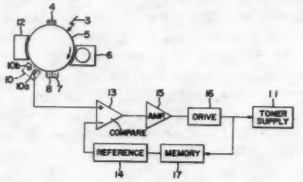


1. A position detecting device for detecting the position of an optical scanning means for an electrophotographic copying machine comprising:
said optical scanning means enabling light to be scanned towards a copy object disposed on a plate means, said optical scanning means including means to reciprocate said optical scanning means;
potentiometer means responsive to a position of the optical scanning means for providing a voltage in conformance with said position of said optical scanning means; and
detection means responsive to said voltage from said potentiometer means for providing a signal for controlling a supply of paper into said electrophotographic copying machine.

4,571,068
TONER SUPPLY CONTROLLING DEVICE

Noriyoshi Tarumi; Masakazu Fukuchi, both of Hachioji, and Kunio Ito, Tama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1983, Ser. No. 474,495
Claims priority, application Japan, Mar. 18, 1982, 57-41657; Apr. 12, 1982, 57-59619
Int. Cl.[4] G03G *15/06, 21/00*
U.S. Cl. 355—14 D 3 Claims

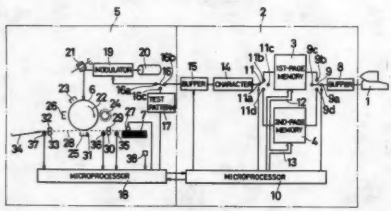


1. In a toner supply controlling device controlling the supply of toner in accordance with a measurement information obtained from a measurement of a developed toner image on a non-image area of a photoreceptor, relating to a reference density image, the improvement comprising a monitoring means for monitoring a continuation status of said supplying of toner, and an altering means for altering a control condition of supplying toner when said continuation status goes up beyond a prescribed level according to a signal from said monitoring means.

4,571,069
RECORDING APPARATUS

Shigeki Kimura; Yoshihisa Ikuta, and Yoshihiro Nakajima, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Japan

Continuation of Ser. No. 467,192, Feb. 16, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,300
Claims priority, application Japan, Feb. 26, 1982, 57-30879
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 8 Claims



1. Image recording apparatus comprising:

printer means for printing pages of image information successively onto sheets of copy paper, each page of image information being printed upon a separate sheet of copy paper; and

an image control circuit for receiving successive pages of image information to be printed and for delivering pages of image information controllably to said printer means to enable said printer means to print each page of image information upon a separate sheet of copy paper, said image control circuit including.

a plurality of page memory means, each of said plurality of page memory means for storing one page of image information to be printed upon a separate sheet of copy paper,

first changeover switch means for writing each page of image information selectively into said plurality of page memory means,

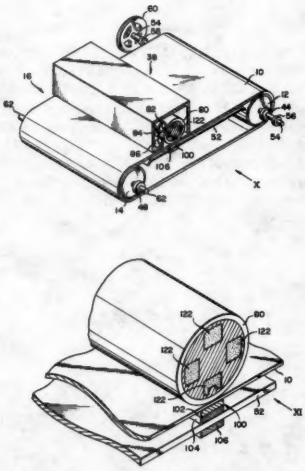
second changeover switch means for selectively reading each page of image information from said plurality of page memory means, and

means for controlling said first and second changeover switch means to normally cause succeeding pages of image information to be written into alternate ones of said plurality of page memory means and to normally cause said second changeover switch means to selectively read a page of image information from one of said plurality of page memory means while said first changeover switch means is selectively writing a page of image information into another of said plurality of page memory means, said means for controlling being responsive to a paper jam occurrence in said printer means for placing said second changeover switch means in a condition to read a page of image information from the previously read page memory means which contains image information for the page associated with said paper jam occurrence.

4,571,070
CLEANING DEVICE FOR PHOTOCONDUCTIVE ELEMENT OF ELECTROPHOTOGRAPHIC COPIER OR THE LIKE

Satoru Tomita, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 593,216
Claims priority, application Japan, Mar. 31, 1983, 58-53991; Apr. 26, 1983, 58-61577[U]
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 14 Claims



1. A cleaning device for removing a developer remaining on a flat surface of a recording element comprising;

rotary cleaning means for removing the residual developer in contact with the surface of the recording element;

pressing contact means for causing the recording element to pressingly contact the cleaning means; and

urging means for urging the pressing contact means toward the cleaning means;

the cleaning means comprising a cleaning sleeve having a length which is substantially equal to an effective width of the recording element, and magnets arranged in said cleaning sleeve;

the urging means comprising first magnetic attraction means for effecting magnetic attraction in cooperation with the magnets of the cleaning means;

the pressing contact means comprising a flat soft member having a length which is substantially equal to a width of the cleaning sleeve, the first magnetic attraction means comprising a first flat magnetic member having a length which is substantially common to the width of the cleaning sleeve;

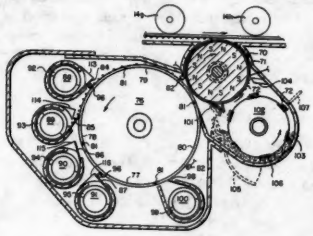
the pressing contact means further comprising a second magnetic attraction means for effecting magnetic attraction in cooperation with the magnets of the cleaning means.

4,571,071

CLEANING APPARATUS AND METHOD FOR A POLYCHROMATIC ELECTROPHOTOGRAPHIC COPIER

Carl R. Bothner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 13, 1984, Ser. No. 599,915
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—15 **27 Claims**



1. In a cleaning apparatus for removing colorant adhered to a surface, the apparatus including a plurality of skiving means each associated with the removal of colorant of a respective color from said surface, means for sequentially advancing each skiving means into engagement with the surface to remove colorant of the respective color therefrom and for maintaining the other skiving means associated with the removal of colorants of other colors not currently being removed from said surface out of engagement with the surface; plural collecting means one of each associated with a respective one of said skiving means for collecting the colorant of a respective color removed by the respective skiving means; and the improvement which comprises:

means for sealing each of said collecting means when its respective skiving means is out of engagement with the surface to block colorant of a different color than that associated with said collecting means from being collected by said collecting means while said colorant of a different color is being removed by one of said skiving means and collected by its respective collecting means.

4,571,072

SYSTEM AND METHOD FOR MAKING CHANGES TO PRINTED WIRING BOARDS

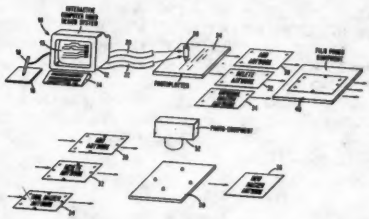
Arthur J. Bourbeau, Jr., Methuen, and John P. Doherty, Haverhill, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1983, Ser. No. 537,901
Int. Cl.⁴ G03B *27/02*
U.S. Cl. 355—79 **30 Claims**

1. A method of making changes to an original master artwork containing an image of a printed wiring pattern of at least one layer of a multiwire printed circuit board, said method comprising the steps of:

generating a first artwork containing a first image of only lines representative of wires/etches to be deleted from said original master artwork wiring pattern;

generating a second artwork containing a second image of only lines representative of wires/etches to be added to said original master artwork wiring pattern; and,



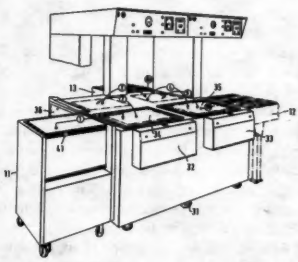
photographically combining said original master, said first and said second artworks for producing a new master artwork in which said lines of said first and second images have been removed and added respectively from said original wiring pattern.

4,571,073

APPARATUS FOR THE EXPOSURE OF PHOTOSENSITIVE PLATES ON TWO SIDES

Klaus Diedrich, Rödermark, and Helmar Weis, Münster, both of Fed. Rep. of Germany, assignors to Firma Wilhelm Staub GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 543,064
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1982, 3238495
Int. Cl.⁴ G03B *27/04*
U.S. Cl. 355—89 **10 Claims**



1. An apparatus for the exposure of photosensitive plates on two sides comprising, two exposure devices each for exposing one side of a photosensitive plate and being mechanically connected and arranged adjacent to each other, two illuminating devices each associated with one of said exposure devices, two glass plates each associated with one of said exposure devices for supporting a master and a photosensitive plate in relation to said exposure devices, means for transporting and reversing a photosensitive plate between said two exposure devices and including two reversing stations each associated with one of said exposure devices and pivoting arm means rotatable by 180 degrees between said exposure devices and said transporting and said reversing stations, whereby a photosensitive plate is removed from one of said exposure devices after exposure and is inverted and transferred to the reversing station associated with said one of said exposure devices, and is then inverted and transferred to the other of said reversing stations, and is then inverted and transferred to the other of

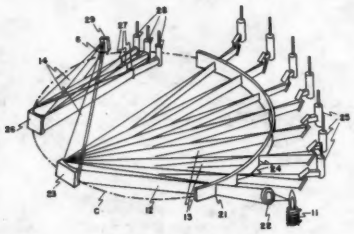
said exposure devices for exposure of the other side of said photosensitive plate.

4,571,074

SPECTROMETRY DEVICE FOR ANALYZING POLYCHROMATIC LIGHT

Alain Thevenon, Bretigny, France, assignor to Instruments S.A., Paris, France

Filed Dec. 23, 1982, Ser. No. 452,480
Claims priority, application France, Jan. 4, 1982, 82 00018
Int. Cl.[4] G01J 3/20
U.S. Cl. 356—51 10 Claims



1. A spectrometry device for spectrographic separation and analysis of a first polychromatic light produced by an excitation source in the ultra-violet, visible and near infra-red region, comprising:

(I) a first spectrographic section, comprising:

(a) first inlet slit means for receiving said first polychromatic light from said excitation source;

(b) coupling means for coupling light from said polychromatic excitation source onto said first inlet slit means;

(c) first grating means for receiving said polychromatic light passing through said first inlet slit means and diffracting light incident on said first grating means into at least one monochromatic bundle in the ultra-violet range and a second O order polychromatic bundle in the visible and near infra-red range, said O order bundle being symmetrical to the incident bundle about a perpendicular to said first grating, and said O order bundle being imaged at a O order focal point;

(d) first outlet slit means positioned for receiving said ultra-violet range monochromatic bundles diffracted from said first grating means; and

(e) first measuring detector means mounted behind the first outlet slit means for measuring the intensity of the ultra-violet range light passing through said first outlet slit means; and

(II) a second spectrographic section for analyzing said O order bundle of light from said first grating means, said second spectrographic section, comprising:

(f) second inlet slit means located at sid O order focal point;

(g) second grating means for receiving said O order bundle passing through said second inlet slit means and diffracting it into at least one monochromatic bundle in the visible/near infra-red region;

(h) second outlet slit means positioned for receiving visible and infra-red light bundles diffracted from said second grating means; and

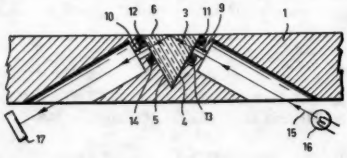
(i) second measuring detector means mounted behind said second outlet slit means for measuring the intensity of said monochromatic bundles in the visible and near infra-red range.

4,571,075

MEASURING WINDOW FOR A PROCESS REFRACTOMETER

Esko Kamrat, Vantaa, Finland, assignor to K-Patents Oy, Helsinki, Finland

Filed Jul. 20, 1983, Ser. No. 515,485
Claims priority, application Finland, Aug. 30, 1982, 822993
Int. Cl.[4] G01N 21/17, 21/41
U.S. Cl. 356—136 2 Claims



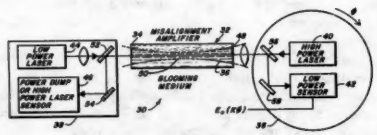
1. A measuring window for a process refractometer including a V-shaped groove in the process wall, a prism of triangular cross section in the V-shaped groove with one side flush with one side of the process wall, there being a hole for the passage of light in both sides of said V-shaped groove, each hole opening also through the side of the wall opposite said one side, and a sealing ring surrounding each hole and in sealed relation both with the prism and with said wall.

4,571,076

BLOOMING AUTO COLLIMATOR

William M. Johnson, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Cambridge, Mass.

Filed Jul. 8, 1983, Ser. No. 512,203
Int. Cl.[4] G01B 11/26
U.S. Cl. 356—152 20 Claims



1. A blooming auto collimator for providing an extremely sensitive signal indication of the degree of colinear misalignment of a comparatively high and a comparatively low-energy optical beam that each traverse a common, but reciprocal, optical path, comprising:

a housing defining a chamber positioned along the common optical path;

a blooming medium disposed in the chamber; and

means operative in response to the comparatively low-energy beam to provide an extremely sensitive indication of the degree of coliner alignment of the comparatively low and the comparatively high-energy optical beams.

4,571,077

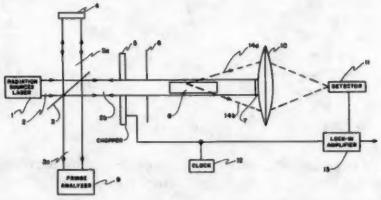
LASER-TESTING SCATTERFEROMETER

Mark D. Skeldon, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 26, 1984, Ser. No. 574,220
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—239 3 Claims

1. A scatterferometer which is an improvement on an interferometer, wherein the interferometer includes: a laser radiation source for providing a test beam, a beam splitter for directing a first portion of said beam to a first retroreflector and a

second portion of the beam to a second retroreflector, whereby a test laser rod is inserted into said second portion of said beam, and whereby said first and second portions of said beam partially recombine as a result of being reflected from said retroreflector, to give a fringe pattern in accordance with imperfections in said test rod, the improvement comprising:



said second retroreflector is made as a highly reflective spot in the center of a positive lens;

a chopper inserted in said second portion of said laser beam;

an aperture for said second portion of said laser beam, between said chopper and said test laser rod; and

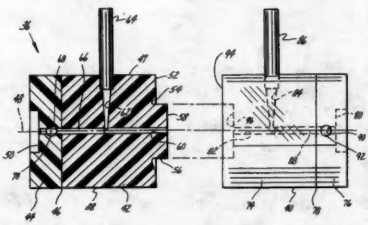
a laser radiation detector on the opposite side of said lens from said spot.

4,571,078

QUICK DISASSEMBLY FLOWCELL

Rodney D. Capps, II, 1274 Shevchenko Dr., Ann Arbor, Mich. 48103

Filed Mar. 10, 1983, Ser. No. 473,902
Int. Cl.[4] G01N *1/10*
U.S. Cl. 356—246 **17 Claims**



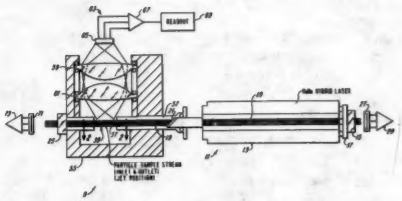
1. In a flow cell comprising a main body provided with a fluid inlet port, a fluid outlet port, and a fluid passage extending through said main body between said fluid inlet and fluid outlet ports, said main body also being provided with a light entrance, a light exit and an optical path extending through said main body between said light entrance and said light exit including a portion of said fluid passage, the improvement which comprises separably joined body portions forming said main body, one section of said fluid passage being in one of said body portions and another section of said fluid passage being in another of said body portions, said light entrance being disposed in said one body portion and said light exit in said another body portion, said optical path extending through a part of said one section of said fluid passage and also through a part of said another section of said fluid passage, said body portions being separably joined by a press-fit connection at respective confronting wall portions thereof.

4,571,079

AEROSOL SAMPLING DEVICE AND METHOD WITH IMPROVED SAMPLE FLOW CHARACTERISTICS

Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Dec. 29, 1983, Ser. No. 566,863
Int. Cl.[4] G01N *15/02, 21/00*
U.S. Cl. 356—336 **18 Claims**



1. In an aerosol sampling apparatus having a laser device with a measuring area in the laser cavity, laser means for generating a laser beam and directing said beam through said measuring area and a restricted inlet through which aerosol to be sampled is introduced into said measuring area, a flow improvement device comprising:

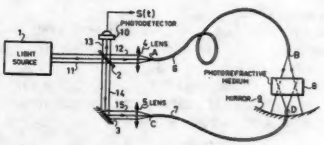
heating means adjacent to said restricted inlet and acting on said aerosol flowing through said restricted inlet so that said aerosol is heated sufficiently to thereby enhance laminar flow of said aerosol through said device to thereby allow operation of said laser means at a higher Q when said aerosol is heated than would otherwise be possible with said aerosol unheated and under like conditions as when heated.

4,571,080

MICHELSON INTERFEROMETER WITH A PHOTOREFRACTIVE MIRROR

Michel Papuchon; Hervé Arditty; Philippe Graindorge, and Jean-Pierre Huignard, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,698
Claims priority, application France, Nov. 9, 1982, 81 20958
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—345 **12 Claims**



1. A Michelson interferometer having a photorefractive mirror, comprising:

a monochromatic radiation source;

an optical beam splitter for splitting radiation from said radiation source into a first portion and a second portion and for distributing the first and second portions of said radiation;

a photorefractive medium provided with a reflector adjacent one side of said photorefractive medium;

a first measuring arm for receiving the first portion of said radiation distributed by said splitter and for transmitting it to said photorefractive medium along a first predetermined direction such that said first portion of said radiation traverses through said photorefractive medium in a first predetermined direction and is reflected by said mirror back through said photorefractive medium in a second

predetermined direction opposite said first predetermined direction back to said first measuring arm;

a second measuring arm receiving the second portion of said radiation distributed by said splitter and transmitting said second portion of said radiation to said photorefractive medium which reflects said second portion back to said second measuring arm, wherein said first and second radiation portions intersect and interact within said photorefractive medium and are then returned to said splitter via said first and second measuring arms, respectively;

a photodetector arranged in relation to said splitter to collect in superimposed relation said first and second portions of said radiation returned to said splitter.

4,571,081

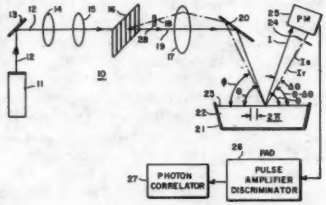
LIGHT SCATTERING APPARATUS AND METHOD

Norman C. Ford, Jr., Amherst, Mass., assignor to Coulter Electronics of New England, Inc., Hialeah, Fla.

Filed Sep. 7, 1982, Ser. No. 415,581

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—349 **17 Claims**



1. Apparatus for analyzing properties of liquids by measuring light scattered from said liquid, said apparatus comprising

(a) means for generating a coherent electromagnetic radiation beam;

(b) means for dividing said beam into an attenuated reference beam and a main scattering beam, said dividing means disposed between said generating means and a liquid the properties of which are to be measured;

(c) means for directing and focussing said main scattering beam at a planar region of said liquid to be analyzed;

(d) means to maintain said scattering beam and said reference beam in substantial coherence as they enter said region to be analyzed;

(e) means for detecting scattered radiation from said main beam and for detecting non-scattered light from said attenuated reference beam; and

(f) means for processing said detected radiation for analysis of detected light and thereby for determining selected characteristics of said liquid.

4,571,082

APPARATUS AND METHOD FOR MEASURING REFRACTIVE INDEX

Michael J. Downs, 'Karibu', Furze Hill Rd., Headley Down, Hampshire, England

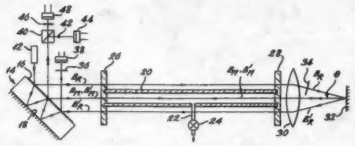
Filed May 17, 1983, Ser. No. 495,431

Claims priority, application United Kingdom, May 18, 1982, 8214383

Int. Cl.⁴ G01N 21/45

U.S. Cl. 356—351 **8 Claims**

8. A method of sensing change in refractive index comprising providing first and second partial beams of electromagnetic radiation having equal amplitudes in two orthogonal directions of polarisation, causing the first partial beam to traverse a transparent medium along an optical path of known length reflecting said partial beam so that it traverses said path through said medium in the reverse direction, causing the second partial beam to traverse a path of equal length but not passing through said medium, introducing a phase difference of 90 degrees between radiation in two orthogonal directions of polarisation in one of the partial beams, combining components of equal intensity derived from the first and second partial



beams to provide first and second output signals deriving a third output signal corresponding to the intensity of the second partial beam only, subtracting the third output signal from each of the first and second output signals and causing a change in the optical path length of the first partial beam through said medium.

4,571,083

STANDING WAVE INTERFEROMETER FOR MEASURING OPTICAL PATH DIFFERENCES

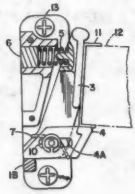
Hans Büchner, 8, Humboldtstrasse, Ilmenau, District of Suhl, German Democratic Rep.

Filed Feb. 28, 1983, Ser. No. 468,328

Claims priority, application German Democratic Rep., Apr. 5, 1982, 238738

Int. Cl.⁴ G01B 9/02

U.S. Cl. 356—358 **3 Claims**



1. A standing wave interferometer for measuring optical path differences between a first object measured and further objects to be measured,

comprising in optical alignment and about an optical axis a light source for emitting coherent and monochromatic light,

a reflector in spaced relation to said light source,

said reflector having a reflecting face and a rear face,

said reflecting face being substantially at right angles to said axis in opposition to said light source,

a measuring head attached to said rear face of said reflector,

an object to be measured being in close at least pointwise contact to said measuring head,

means for displacing said measuring head and

said reflector in parallel to the reflecting face along said optical axis,

said light source and said reflector being for producing a standing wave from said monochromatic and coherent light,

a first pair of wedges and

a second pair of wedges being inserted via their effective faces into said standing wave between said light source and said reflector and being symmetrical relative to said optical axis,

adjacent faces of the opposing individual wedges being parallel to one another,

said first pair of wedges and said second pair of wedges

including an air space being closed by a top spacer and a bottom spacer, the opposing wedge faces forming said air space having each a substantially transmissive photodetecting layer substantially in parallel to said reflecting face and at a definite mutual relation defined by the wavelength of said standing wave for producing sine voltages from said standing wave portions contacting each of said photodetecting layers,

said photodetecting layers being each provided with electric lines,

means for inhibiting feed back of said standing wave to said light source,

and an electronic evaluation unit for evaluating said sine voltages, in converting the latter into units of length,

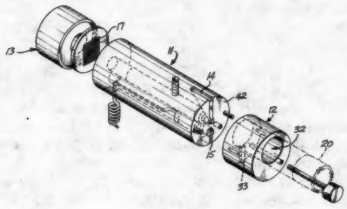
said evaluation unit being connected to each of said photodetecting layers via said electric lines.

4,571,084

TUBE END SQUARENESS PROJECTOR APPARATUS

Dale E. Wright, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 23, 1983, Ser. No. 468,922
Int. Cl.⁴ G01B *9/08, 11/24*
U.S. Cl. 356—391 **8 Claims**



1. An optical inspection device for measuring the squareness of tube cuts comprising:

means for generating a light beam;

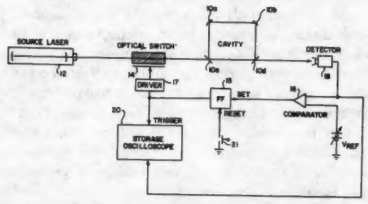
a tube guide member arranged to be rotated while viewing the end of a tube and positioning said tube wall in the path of said light beam wherein the light output is magnified and projected upon a viewing screen to measure the squareness of a tube cut and, wherein the mismatch of said end of a tube with a projector housing end surface will cause said light beam to pass from a first mirror to a further mirror.

4,571,085

REFLECTOMETER BASED ON OPTICAL CAVITY DECAY TIME

Dana Z. Anderson, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 11, 1983, Ser. No. 540,788
Int. Cl.⁴ G01N *21/55*
U.S. Cl. 356—445 **11 Claims**



1. A method for making decay time measurements of an optical cavity having at least two reflecting optical elements comprising the steps of

directing a beam of light into said optical cavity,

switching the beam of light into said optical cavity off when the beam intensity of the cavity reaches a predetermined threshold level,

monitoring the beam intensity decay of the optical cavity, and

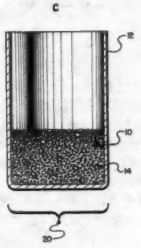
measuring the intensity decay time directly.

4,571,086

MIXING OF CERAMIC POWDERS

John R. Wooten, Chatsworth; Robert J. Walter, Thousand Oaks, both of Calif., and Thomas M. Shaw, Golden's Bridge, N.Y., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 26, 1984, Ser. No. 654,427
Int. Cl.⁴ B01F *11/02*
U.S. Cl. 366—127 **3 Claims**



1. A process of preparing ceramic powders prior to sintering, comprises the steps of:

dispersing a ceramic powder and sintering aids in a low-boiling dispersing liquid to form a suspension;

ultrasonically vibrating said suspension to defloculate agglomerates which may have formed; and

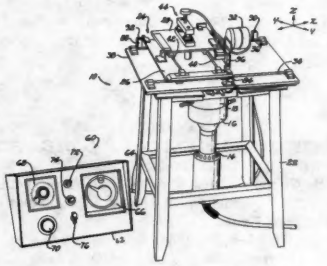
continuing to ultrasonically vibrate the suspension until said dispersing liquid is evaporated.

4,571,087

ARRAY SONICATOR APPARATUS FOR AUTOMATED SAMPLE PREPARATION

David F. Ranney, Dallas, Tex., assignor to Board of Regents, University of Texas System, Austin, Tex.

Filed Mar. 22, 1983, Ser. No. 477,612
Int. Cl.⁴ B01F *11/02, 15/06;* **G01N** *21/64*
U.S. Cl. 366—108 **8 Claims**



1. Apparatus for automatically sonicating the contents of each of a plurality of sample containers arranged in a planar, two-dimensional array, comprising:

means for emitting a shaped ultrasonic energy field directed

along a defined propagation path and of sufficient intensity to produce sonication of the contents of a sample container;

an extension bath disposed adjacent the sonication means in a plane transverse to the propagation path of the ultrasonic energy field, for providing sonic coupling of the ultrasonic energy field to the contents of a sample container to provide sonication thereof;

means mounting the array of sample containers for translational movement between locations in a plane transverse to the propagation path of the ultrasonic energy field;

means for adjusting the position of the array of sample containers transversely with respect to the plane of the extension bath, to immerse a predetermined portion of each sample container therein and provide control of the sonicating effect on the contents of the sample containers; and

a controller for automatically directing the array translational movement means to individually place by stepped movement each sample container of the array into the path of the ultrasonic energy field.

4,571,088

PROCESS FOR THE PREPARATION OF DISPERSIONS OF PLANT PROTECTION AGENTS

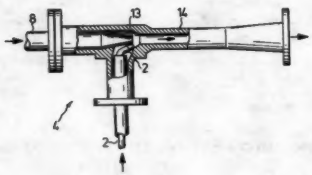
Heinz Frensch, Frankfurt am Main; Konrad Albrecht, Kelkheim, and Gerhard Frisch, Wehrheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,695

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337964

Int. Cl.⁴ B01F *15/00*

U.S. Cl. 366—136 **12 Claims**



1. A process for the preparation of dispersions of plant protection agents which contain one or more active ingredients and auxiliary formulation aids, wherein at least one active ingredient is metered, in molten form, into an outlet stream of a jet, which outlet stream contains an aqueous or organic solution of the formulation aids, and the temperature difference between the molten active ingredient and the solution of formulation aids being at least 15° C.

4,571,089

MACHINE FOR BLENDING AND DEGASSING POWDERS

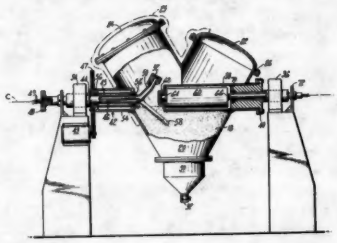
Edward B. Gudlauski, and Thomas R. Wagner, both of New Hartford, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1984, Ser. No. 649,082

Int. Cl.⁴ B01F *13/06, 15/06, 9/02*

U.S. Cl. 366—139 **5 Claims**

1. Apparatus for blending powders comprised of a shell positioned on a rotatable mounting for containing powders in a vacuum or a gaseous atmosphere; characterized by a heater housing attached to the shell and projecting into the shell interior, mounted co-axially with the rotatable mounting of the shell; a heater rotatably mounted within the heater housing, the heater remaining static when the shell and housing rotate;



wherein rotation of the shell will cause any powders contained therein to contact the housing.

4,571,090

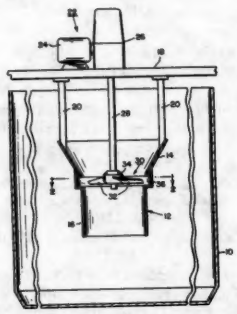
MIXING SYSTEMS

Ronald J. Weetman, Rochester; Jerry A. Carpenter, Brockport; Chandler K. Coyle, Pittsford; Keith T. McDermott, Rochester, and Roger N. Voss, Dansville, all of N.Y., assignors to General Signal Corp., Rochester, N.Y.

Continuation of Ser. No. 599,109, Apr. 11, 1984, abandoned. This application Aug. 26, 1985, Ser. No. 769,998

Int. Cl.⁴ B01F *5/10*

U.S. Cl. 366—270 **40 Claims**

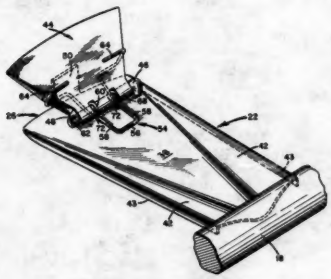


20. Apparatus for circulating liquids having fibers suspended therein in a region containing said liquids which comprises a shaft in said region containing said liquids, an axial flow impeller having a plurality of blades, said impeller being disposed in said tank on said shaft, said blades having opposite edges one of which leads the other as said impeller rotates, said leading edges being inclined with respect to radial lines from the axis of said impeller in planes perpendicular to said axis at angles greater than the angle of repose of said fibers on said impeller as said impeller rotates through said liquids and said liquids flow in the direction axially of said impeller thereby preventing the accumulation of said fibers on said leading edge and the increase of drag on said impeller which prevents the rotation thereof at sufficient speed to circulate said liquids without increasing the power applied to rotate said shaft.

4,571,091
FOOD PROCESS AGITATOR

Warren A. Pardo, Bel Air; Richard J. Pardo, and Valentino Gabriele, both of Baltimore, all of Md., assignors to J. C. Pardo and Sons, Baltimore, Md.

Filed Feb. 22, 1983, Ser. No. 468,764
Int. Cl.[4] B01F 7/04
U.S. Cl. 366—311 **28 Claims**



1. In a mixing apparatus including a kettle within which materials are mixed by the action of an agitator, the improvement comprising:

a rotary shaft disposed within the kettle at an angle to the vertical;

blade means carried by the shaft for displacing and lifting the materials to mix material in portions of the kettle with material in other portions thereof;

scraper means carried by the blade means for scraping inner walls of the kettle to prevent binding of the material to said inner walls and to facilitate heat transfer through said walls; and,

means carried by the blade means for constantly adjusting the position of the scraper means to accommodate surface irregularities in the inner walls of the kettle and surface wear of the scraper means to maintain the scraper means in scraping relation to the inner walls of the kettle, the adjusting means comprising

a pin carried by the blade means and having a portion which is spaced from the surface of the blade means and is substantially parallel thereto, the scraper means being received for pivotal movement on said portion of the pin, and,

spring means carried on the portion of the pin and having a first portion which biases against the blade means and a second portion which biases against the scraper means for holding the scraper means under tension.

4,571,092
LIQUID MIXING SYSTEM

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Sep. 6, 1984, Ser. No. 647,893
Int. Cl.[4] B01F 7/22, 15/02
U.S. Cl. 366—348 **10 Claims**

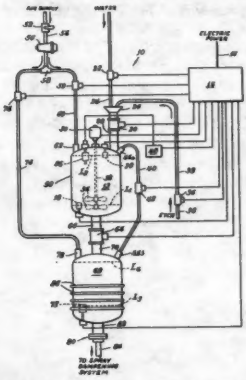
1. A liquid mixing system for mixing and providing a discharge of liquid from the system under a constant pressure, said system comprising:

batch mixer means including a pressurizable mixing vessel and means for mixing liquids therein, said mixing vessel having a valved inlet for receiving liquids to be mixed and a valved outlet for transferring a batch of mixed liquids and mixing means within said vessel;

a pressurizable feed tank means in fluid communication with the valved outlet of said batch mixer means, whereby mixed liquids transferred from said batch mixer means into said feed tank means, said feed tank means having an outlet means capable of outletting a continuous discharge rate of mixed liquids;

means for pressurizing said mixing vessel and said feed tank means; and,

control means for opening the valved inlet of said mixing vessel so that liquids may be introduced thereinto, for actuating said mixing means, for closing the valved inlet

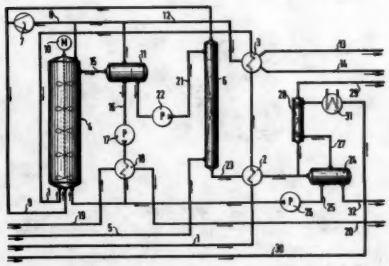


after said mixing vessel has been fully charged for pressurizing the vessel, for opening the valved outlet to transfer the mixed liquids from the mixing vessel to the feed tank means under pressure, and for closing the valved outlet while maintaining the feed tank means under substantially constant pressure during mixing and transfer operations; whereby mixed liquids may be constantly discharged under pressure through said feed tank outlet means.

4,571,093
METHOD OF TESTING PLASTIC-PACKAGED SEMICONDUCTOR DEVICES

G. Eugene Gottlieb, East Brunswick, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 4, 1983, Ser. No. 548,611
Int. Cl.[4] G01N 13/00
U.S. Cl. 374—57 **4 Claims**



1. The method of life-testing semiconductor devices encapsulated in plastic packages by speeding up the moisture ingression rate comprising the steps of

assembling a group of plastic-encapsulated semiconductor devices,

treating said devices in a pressure cooker for a time in the range of about 24 to about 96 hours at a temperature in the range of about 130° C. to about 121° C., and

thereafter submitting said devices to an 85° C. temperature

and 85% humidity for a time in the range of about 50 to about 100 hours.

4,571,094

FURNACE WALL ASH MONITORING SYSTEM

John R. Wynnyckyj, Kitchener; Edward Rhodes, Waterloo, and Allan K. Chambers, Edmonton, all of Canada, assignors to University of Waterloo, Waterloo, Canada

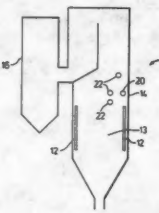
Continuation-in-part of Ser. No. 529,094, Sep. 2, 1983, which is a division of Ser. No. 320,604, Nov. 12, 1981, Pat. No. 4,408,568.

This application Nov. 7, 1983, Ser. No. 548,955

The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.

Int. Cl.⁴ G01K *17/00*

U.S. Cl. 374—29 **16 Claims**



1. A method of monitoring the build up of deposits of ash from a product gas stream produced by an ash-generating combustion operation on a surface contacted by said product gas stream, which comprises:

simultaneously determining the actual heat flux produced by said combustion operation and theoretically capable of reaching said surface and the heat flux reaching said surface, and determining the difference in heat flux value as a measure of the build up of ash on said surface.

4,571,095

APPARATUS FOR MEASURING A TEMPERATURE

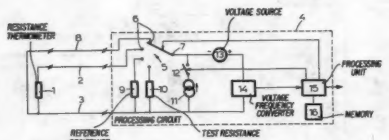
Johannes Stoffels, Delft, Netherlands, assignor to B.V. Enraf-Nonius Delft, Netherlands

Filed Jul. 18, 1984, Ser. No. 632,129

Claims priority, application Netherlands, Jul. 20, 1983, 8302593

Int. Cl.⁴ G01K *7/16*

U.S. Cl. 374—167 **3 Claims**



1. Apparatus for measuring a temperature, comprising a first resistance, the resistance value of which depends on the temperature to be measured, a second resistance, a multiple switch means with a plurality of inputs and an output, wherein each said resistance is connected to a corresponding input, a supply source which can be selectively coupled with both resistances through a switch, and a processing unit for controlling said switch and said multiple switch means and for determining the temperature in dependence on voltages measured at said multiple switch means as the supply source is being switched on and off, respectively, by said switch in the subsequent positions of the multiple switch means, characterized in that the output of said multiple switch means is connected to an input of a voltage/frequency converter through a voltage source, an output of said voltage/frequency converter being connected to the processing unit to determine the temperature.

4,571,096

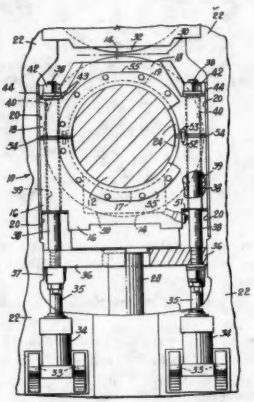
SELF-ADJUSTING MINIMUM CLEARANCE BEARING

Archie N. Swasey, Oxford, and William J. Winter, Trumbull, both of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Apr. 20, 1984, Ser. No. 602,539

Int. Cl.⁴ F16C *23/00*

U.S. Cl. 384—266 **4 Claims**



1. A bearing for roll journals comprising a two piece bearing sleeve rotatably receiving a journal of a roll; a pair of opposed bearing boxes each receiving one piece of the bearing sleeve, means for mounting the bearing boxes for movement toward and away from each other diametrically of a journal in the bearing sleeve, said mounting means including a loading plate, means for locating one of the bearing boxes in the mounting means at a predetermined position for locating one of the bearing sleeve pieces and the roll journal therein with respect to a roll nip, means for moving the other bearing box in the mounting means diametrically toward the one bearing box for pressing the other bearing sleeve piece toward the journal to provide a minimum clearance between the bearing sleeve pieces and the journal, said moving means including fluid operated piston cylinder devices secured at opposite sides of the journal to said load plate which in turn is connected to the other bearing box by rods loosely passing through the one bearing box, the rods being flexibly connected to the other bearing box to permit the bearing assembly to follow bending movements of the roll journals.

4,571,097

TAPERED ROLLER BEARING WITH PRESSURIZED RIB RING

Peter W. Lee, Canton; Gary E. Kreider, Massillon, and Ronald L. Widner, North Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

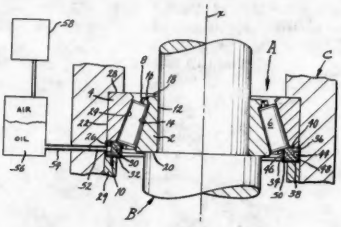
Filed Jan. 24, 1985, Ser. No. 694,441

Int. Cl.⁴ F16C *33/66*

U.S. Cl. 384—469 **19 Claims**

1. A tapered roller bearing assembly comprising: a first race having a tapered raceway: a second race having a raceway located opposite the raceway of the first race; tapered rollers arranged in a circular row between the two races and contacting the raceways so as to roll along the raceways when one of the races turns relative to the other race; a rib ring mounted in a generally fixed position with respect to one of the races and

having an abutment surface against which the large ends of the tapered rollers bear so as to prevent the rollers from being expelled from the space between the two raceways, the rib ring including a porous material, the pores of which are exposed along the abutment surface; and means for introducing fluent



lubricant into the porous material of the rib ring remote from the abutment surface, so that the lubricant flows through the pores of that material and emerges at the abutment surface where it reduces friction between the abutment surface and the large end faces of the tapered rollers.

4,571,098

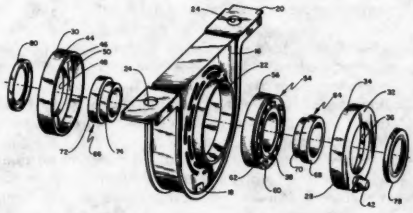
CARRIER BEARING ASSEMBLY

Everett Rudnik, 49750 Highway 24, Burlington, Colo. 80807

Filed Mar. 20, 1985, Ser. No. 714,170

Int. Cl.[4] F16C *27/06*

U.S. Cl. 384—474 **8 Claims**



1. A carrier bearing assembly adapted to be connected to a vehicle for use in supporting and interconnecting a pair of drive shaft sections, said carrier bearing assembly including:

a first casing having an annular member and a wall extending from said annular member, said annular member defining a bore, said first casing also having a port and a recess defined by said annular member and said wall;

a grease fitting received in said port of said first casing and connected thereto;

a second casing, non-integral with and separate from said first casing, said second casing having an annular member and a wall extending from said annular member, said annular member defining a bore, a recess being defined by said annular member and said wall;

race means having a first portion and a second portion, a first portion of said race means being received into said recess of said first casing and said second portion of said race means being received into said recess of said second casing;

bearing means located adjacent to said race means;

at least a first sleeve member disposed adjacent to said race means for receiving at least one of the drive shaft sections; and

sealing means disposed between said sleeve member and one of said first casing or second casing for use in preventing contaminants from entering past said one casing and for use in containing a lubricant used by said bearing means.

4,571,099

BEARING ASSEMBLY FOR WHEEL HUB DRIVEN BY A UNIVERSAL JOINT

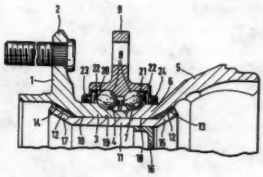
Jochen Balken, Neunkirchen; Werner Krude, Siegburg, both of Fed. Rep. of Germany, and Michel A. Orain, Conflans-Sainte-Honorine, France, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,596

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239121

Int. Cl.[4] F16C *33/58, 33/60, 43/04*

U.S. Cl. 384—513 **3 Claims**



1. A bearing assembly for a wheel hub driven from a universal joint especially suitable for use in a motor vehicle comprising: outer race means adapted for attachment to wheel carrier means of said motor vehicle, said outer race means having first and second outer bearing tracks formed therein; inner race means having first and second inner bearing tracks thereon arranged substantially coaxially with said first and second outer bearing tracks; first bearing elements in bearing engagement between said first inner and said first outer bearing tracks; second bearing elements in bearing engagement between said second inner and said second outer bearing tracks; a first tubular projection extending from said universal joint having said first inner bearing tracks thereon; a second tubular projection extending from said wheel hub having said second bearing tracks thereon; a second tubular projection extending from said wheel hub having said second bearing tracks thereon; said first and said second tubular projections having juxtaposed inner cylindrical surfaces; sleeve means comprising a generally cylindrically shaped sleeve having opposite tapered ends fitted to extend within said juxtaposed inner cylindrical surfaces for connecting said wheel hub and said inner joint member in torque-transmitting engagement; said sleeve means and said first and second tubular projections including cooperating formations for securing said tubular projections against relative axial displacement; first gear teeth provided at each of said opposite tapered ends of said sleeve; and second gear teeth formed at each of said wheel hub and said universal joint engaging respectively with said gear teeth on said opposite ends of said sleeve; with at least one of said tapered ends of said sleeve consisting essentially of a part of said sleeve which has been connected in said assembly by undergoing deformation.

4,571,100

ELECTRONIC TYPEWRITER

Hideo Ueno, and Yuji Kurokawa, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 9, 1984, Ser. No. 598,440

Claims priority, application Japan, Apr. 26, 1983, 58-73488

Int. Cl.[4] B41J *29/26, 3/12*

U.S. Cl. 400—17 **4 Claims**

1. An electronic typewriter, in which one continuous vertical line can be printed extending across a plurality of horizontal printing lines, said typewriter comprising

a printer for performing a printing operation using a print

head which is shiftable along a printing line of a printing paper;

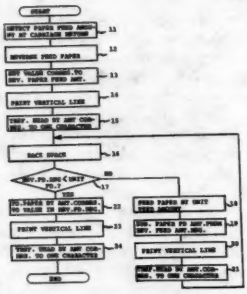
a keyboard having a number of character keys, various function keys, including a vertical tab key for generating a vertical tab signal, and various selecting switches arranged thereon; means to enable a continuous vertical line to be printed in response to the actuation of only one key including means to enable said printer to print a unit length of a vertical line, in response to said vertical tab signal, said unit length of said vertical line being sufficient to form a continuous vertical line when two or more vertical lines of unit lengths in adjoining printing lines are printed on adjacent lines and in vertical alignment;

a paper feed device for feeding said printing paper forwards and backwards, in a direction perpendicular to said printing line of said printing paper; and

means for controlling said printer and said paper feed device, responsive to data entered from said keyboard, said means for controlling comprising

means for detecting the amount of paper fed between a previous printing line and a present printing line, in response to a vertical tab signal being entered from said keyboard;

first means for controlling said paper feed device to feed said paper reversely so as to connect a vertical line printed in said previous printing line with a next printed vertical line by superimposing the lower end of said vertical line in said



previous printing line and the upper one end of said next printed vertical line;

a register for storing a paper feed amount fed by said first controlling means, said paper feed amount being less than said feed amount of said paper detected by said detecting means;

second means for controlling said paper feed device to feed said paper forwards by a unit feed amount less than said unit length of said vertical line, in case the value in said register is equal to or more than said unit feed amount;

means for subtracting said unit feed amount from said value in said register each time said paper is fed forwards by said unit feed amount;

said second controlling means controlling said paper feed device to feed said paper by a feed amount corresponding to a remaining value in said register upon said subtracting operation of said means for restoring said paper to said present printing line, in case said value in said register is less than said unit feed amount; and

third means for controlling said printer to print said unit length of a vertical line each time said paper is fed when said vertical tab signal is entered from said keyboard, whereby one continuous vertical line is printed from said previous printing line to said present printing line without breaks or protrusions and the terminal end of the printed vertical line is aligned at the exact position of said present printing line.

4,571,101

PRINT HEAD

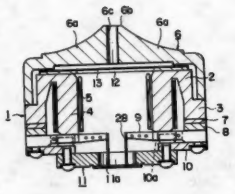
Atsuo Sakaida, Gifu; Masafumi Kawaura, Nagoya; Yasuji Chikaoka, Shippocho; Hiroshi Iwata, Nagoya, and Kiyomitsu Asano, Mussashino, all of Japan, assignors to Brother Industries, Ltd. and Nippon Telecommunication Engineering Company, both of, Japan

Filed Oct. 19, 1984, Ser. No. 662,725

Claims priority, application Japan, Oct. 20, 1983, 58-163206[U]; Oct. 20, 1983, 58-163207[U]

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124 **1 Claim**



1. A print head for movement in a preselected direction comprising:

a cylindrical yoke member (1);

a front wall portion positioned so as to cover one of the end faces of said cylindrical yoke member;

a rear wall portion positioned so as to cover the other of the end faces of said cylindrical yoke member;

comb-like portions (4) arranged in annular form inside said cylindrical yoke member;

a plurality of coils (5) each wound around each of said comb-like portions and forming a space therebetween;

a plurality of armatures (21) each arranged in opposite relation to each of said comb-like portions;

a plurality of printing wire (28) each connected at one end to each of said armatures and at the other end projecting outwardly from the front wall portion;

said print head being provided with a suction hole (14) such that it opens outwardly at said front wall and communicates with said space; and

said rear wall being formed with a projection portion (6) which increases progressively in amount of projection in the direction of movement of the print head terminating in an extreme end, said projection portion being provided with a discharge hole (6C) opening at said extreme end and communicating with said space said discharge hole being positioned at a low pressure region with respect to air pressure at said suction hole, said low pressure region being generated by the movement of the print head to form a cooling air stream through said suction hole and said space.

4,571,102

RIBBON MASK DEVICE

Toshiaki Ono, and Yoshito Kusabuka, both of Suwa, Japan, assignors to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

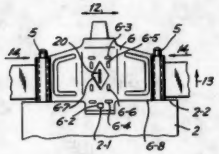
Filed Oct. 9, 1984, Ser. No. 658,854

Int. Cl.[4] B41J *35/04*

U.S. Cl. 400—248 **12 Claims**

1. A printing device for use in a wire dot printer having a plurality of printing wires comprising a frame, carriage means slideably supported on said frame for lateral translation thereacross, print head means supported on said carriage means having a nose portion for holding said plurality of wires, first and second holder means disposed on said carriage means so that said nose portion is intermediate said first and second holder means, and a ribbon mask constructed from a resilient material and disposed on said nose portion, said ribbon mask being held in position to extend laterally across said nose por-

tion by engagement with said first and second holder means, said carriage means having a projection extending toward said ribbon mask, said ribbon mask including an opening in which said projection is removably captured to substantially prevent



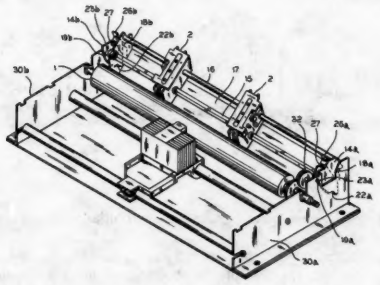
longitudinal movement of said ribbon mask with respect to said nose portion while said projection extends through said opening, said projection and opening being sized to permit manual movement of said ribbon mask away from said nose portion to release said projection from said opening.

4,571,103

PRINTER

Seiji Takeo, and Akira Amari, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,569
Claims priority, application Japan, Oct. 17, 1983, 58-193810
Int. Cl.[4] B41J *11/00*
U.S. Cl. 400—616.2 **4 Claims**



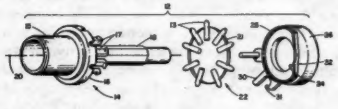
1. A printer having a head for printing on paper and a tractor drive mechanism for transporting said paper past said head, both said head and said tractor being mounted on a chassis, said printer comprising: a cylindrical platen supported on said chassis and disposed opposite said head for supporting said paper to absorb an impact caused by the head striking said paper during the printing operation, the platen being positioned between sides of said chassis; tractor means for driving the paper across said platen; means for selectively converting said tractor means to either a pull type tractor structure or a push type tractor structure including support means for supporting said tractor means for movement between a first position which positions said tractor means to pull paper from said platen after having been printed by said head thereby positioning said tractor means for a pull-tractor type operation and displaced from said first position a second position which positions said tractor means to feed said paper to said platen before printing thereby positions said tractor means for a push-tractor type operation, whereby the tractor structure can selectively provide either a pull-tractor type structure or a push-tractor type structure depending upon which of said two positions said tractor occupies.

4,571,104

RETRACTABLE PIN SPROCKET WHEEL ASSEMBLY

Werner Jung, Morton Grove, and Alfred Z. Purzycki, Arlington Heights, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed May 31, 1984, Ser. No. 615,980
Int. Cl.[4] B41J *11/27*
U.S. Cl. 400—616.3 **3 Claims**



1. A cylindrical platen having a cylindrical opening at each end;

a pair of pin sprocket wheel assemblies located at opposite ends of the platen;

each wheel assembly comprising a main body including a hub adapted to fit into one of the openings of the platen, the dimensions of the hub and the opening being such as to effect an interference fit between the two;

a rim, concentric with the hub, having an outside diameter substantially equal to the diameter of the platen, the rim having a plurality of notches emanating radially from the center of the rim toward its periphery;

a plurality of flexible fingers extending in a direction normal to the direction of the notches, each of the fingers located between two adjacent notches and along a circumference concentric with the rim;

a readily replaceable unitary pin assembly comprising a plurality of circumferentially spaced radially extending pins interconnected by a flexible molded ring integrally formed with said pins;

a uniform width cam having a cylindrical opening of a diameter sufficiently large to accommodate the plurality of flexible fingers while permitting relative motion between the cam and the rim;

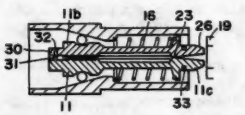
means for rotatably locking the cam to the rim; and means associated with the cam for sequentially moving the pins in and out past the periphery of the rim.

4,571,105

LEAD ENGAGING CHUCK MECHANISM FOR MECHANICAL PENCIL

Tomozo Sekiguchi, Kawaguchi, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,652
Int. Cl.[4] B43K *21/16*
U.S. Cl. 401—65 **4 Claims**



1. In a lead engaging chuck mechanism for a mechanical pencil, said mechanism being of the type including an axially movable chuck body, and a chuck actuation cylinder surrounding said chuck body in such a manner that axial movement of said chuck body in opposite directions within said chuck actuation cylinder moves said chuck body radially between positions for engagement and disengagement of a writing lead within said chuck body, the improvement wherein:

said chuck body comprises a plurality of longitudinal chuck elements positioned in longitudinal confronting relation, each said chuck element having a flange portion acted on

by a spring means for biasing said chuck body axially rearwardly with respect to said chuck actuation cylinder to said engagement position, a rear end portion for receiving an axial forward thrust to move said chuck body against said spring means to said disengagement position, and a lead engaging front portion urged by said chuck actuation cylinder in said engagement position by the spring force of said spring means to grip the writing lead;

fulcrum means positioned at confronting portions of said chuck elements at locations adjacent said flange portions for enabling relative pivotal movement of said chuck elements when in said disengagement position; and

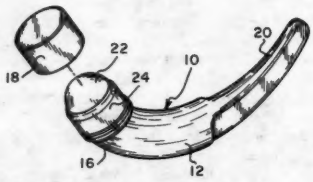
taper means for imparting radial inward movement to said rear end portions about said fulcrum means, and thereby radial outward movement of said lead engaging front portions about said fulcrum means, upon receipt by said rear end portions of said axial forward thrust to move said chuck body against said spring means to said disengagement position.

4,571,106

SUN LOTION APPLICATOR

Richard Scuderi, 12 S. Benson, Box 3323, Margate, N.J. 08402

Filed Jan. 9, 1984, Ser. No. 569,409
Int. Cl.[4] A45D *34/04*
U.S. Cl. 401—209 **5 Claims**



1. An applicataor device to apply liquids comprising:

(a) a container comprising:

(i) an open end,

(ii) a base surface,

(iii) a body extension in a generally upwardly direction at an angle to the base surface terminating at the open end, and

(iv) a second body extension in a generally upwardly direction at an angle to the base surface away from the open end,

wherein the length of the container is sufficient to allow hand holding by a person of the terminal portion of the second body extension and reach the ball applicator means to the most inaccessible portions of the person's skin surface, such as the small of the back, and

wherein the extensions are hollow and in communication with the contents of the container,

(b) a ball applicator means comprising a ball to apply liquid from its surface, positioned partially within the open end, and

(c) a retaining means to hold the ball in the open end while allowing the ball to rotate in place,

wherein the ball applicator means may be contacted by any contents of the container.

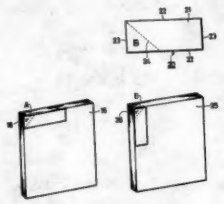
4,571,107

CORNER COVER FOR USE IN BINDING

Saburo Takada, No. 7-22-6, Seijho, Setagaya-ku, Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,987
Int. Cl.[4] B42F *13/06*; B42D *5/00*; B42B *5/00*
U.S. Cl. 402—14 **4 Claims**

1. In combination, a reinforcing cover for the corner of a document, and a multi-sheet document bound at a corner by a staple: said cover consisting of a sheet member formed from a flexible, foldable, non-metallic material, being in the form of a rectangle having a short side and a long side at least twice as long as said short side, said sheet member being folded along a line dividing one of the angles of said rectangle and at an angle such that the fold line forms the base of an isosceles triangle,



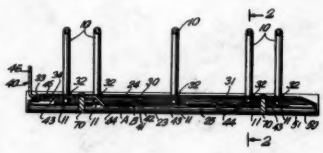
one side of said triangular portion of said sheet material being superimposed over the inner corner of a first sheet of said bound documents, stapled thereto and folded along said fold line so as to wrap around a portion of the exposed edge of said bound documents.

4,571,108

LOCKING RING BINDER MECHANISM WITH CONTROL SLIDE

Kurt Vogl, 621 Terrill Rd., Fanwood, N.J. 07023

Filed Nov. 26, 1982, Ser. No. 444,734
Int. Cl.[4] B42F *3/04, 13/20*
U.S. Cl. 402—38 **11 Claims**



1. An improvement in loose-leaf binder ring mechanisms comprising:

a deformable member comprising a pair of elongated, generally rectangular plates abutting in hinged relationship along the longitudinal axis of the deformable member, the deformable member having a first aperture and a second aperture located along the longitudinal axis;

a plurality of parallel leaf holding rings located in separate planes perpendicular to the longitudinal axis of the deformable member,

each ring comprising two opposed portions,

each ring portion having an attached end secured to one of the rectangular plates of the deformable member, and

each ring portion having a free end opposing the free and of the other ring portion and meeting the other ring portion when the rings are in their closed position;

a stiff, but resilient cover over the deformable member and a base under the deformable member, the cover engaging the deformable member so that the deformable member is biased into one of two equilibrium configurations, upwardly convex and upwardly concave, the free ends of the ring portions being spaced apart in a binder-open position when the deformable member is in the upwardly convex configuration and the free ends of the ring portions being in abutment in a binder-closed position when the deformable member is in an upwardly concave configuration;

a control slide located between the cover and base which

holds the rings alternatively in the binder-open and binder-closed positions, the control slide being longitudinally moveable between a first position in which the rings are closed and a second position in which the rings are open, the control slide having means protruding outside the cover for the user to grip and actuate the control slide;

the improvement wherein the control slide comprises an elongated member extending parallel to the longitudinal axis of the deformable member, one end of the control slide being located between the cover and the deformable member, the control slide then passing through the first aperture, extending between the base and the deformable member to the second aperture, passing through the second aperture, and extending for a further distance between the cover and the deformable member;

the control slide having a sloping cam on its upper surface which engages a first edge of one of said apertures as the control slide is moved from the first position toward the second position while another portion of the control slide bears on the base, forcing the deformable member into its upwardly convex configuration and bringing a portion of the control slide beneath the deformable member, causing the rings to open and holding them open, and

the control slide having a further sloping cam on its lower surface which engages a second edge of said one of said apertures as the control slide is moved from the second position to the first position while another portion of the control slide bears on the cover, forcing the deformable member into its upwardly concave configuration and bringing a portion of the control slide above the deformable member, causing the rings to close and holding them closed.

6. An improvement in loose-leaf binder ring mechanisms comprising:

a deformable member comprising a pair of elongated, generally rectangular plates abutting in hinged relationship along the longitudinal axis of the deformable member,

a plurality of parallel leaf holding rings located in separate planes perpendicular to the longitudinal axis of the deformable member,

each ring comprising two opposed portions,

each ring portion having an attached end secured to one of the rectangular plates of the deformable member, and

each ring portion having a free end opposing the free end of the other ring portion and meeting the other ring portion when the rings are in their closed position;

a stiff, but resilient cover over the deformable member and a base under the deformable member, the cover engaging the deformable member so that the deformable member is biased into one of two equilibrium configurations, upwardly convex and upwardly concave, the free ends of the ring portions being spaced apart in a binder-open position when the deformable member is in the upwardly convex configuration and the free ends of the ring portions being in abutment in a binder-closed position when the deformable member is in an upwardly concave configuration;

a control slide located between the cover and base which holds the rings alternatively in the binder-open and binder-closed positions, the control slide being longitudinally movable between a first position in which the rings are closed and a second position in which the rings are open, the control slide having means protruding outside the cover for the user to grip and actuate the control slide;

the improvement wherein the control slide comprises a stiff ribbon having a plurality of control slide sections arranged longitudinally in sequence as follows

a first slide section located at and extending on an upper level adjoining the cover,

a second slide section extending downward to a lower level adjoining the base,

a third slide section extending upwardly to a first intermediate level between the upper and lower levels,

a fourth slide section extending downwardly to a second intermediate level between the first intermediate level and the lower level,

a fifth slide section extending upwardly to the upper level, and

a sixth slide section extending on the upper level adjoining the cover;

the deformable member having a first aperture and a second aperture located along the central longitudinal axis;

the second slide section passing through the first aperture from the upper level to the lower level;

the control slide passing through the second aperture in the vicinity of the third through fifth sections, the location of said sections with respect to the second aperture depending upon the longitudinal position of the control slide,

the third slide section having a sloping cam on the upper surface of the control slide which engages a first edge of the second aperture as the control slide is moved from the first position toward the second position while the lower level of the control slide bears on the base, forcing the deformable member into its upwardly convex configuration and bringing the first intermediate level of the control slide beneath the deformable member, causing the rings to open and holding them open,

the fifth slide section having a sloping cam on the lower surface of the control slide which engages a second edge of the second aperture as the control slide is moved from the second position to the first position while the upper level of the control slide bears on the cover, forcing the deformable member into its upwardly concave configuration and bringing the second intermediate level of the control slide above the deformable member, casing the rings to close and holding them closed.

4,571,109

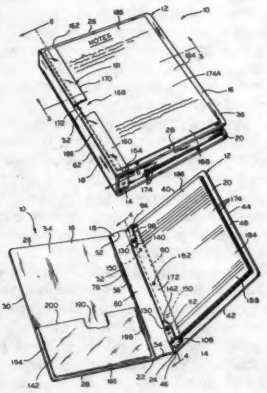
LOOSELEAF NOTEBOOK ARRANGEMENT

Samuel P. Lapertosa, Hinsdale, Ill., assignor to Sales Tools, Inc., Des Plaines, Ill.

Filed Feb. 6, 1984, Ser. No. 577,198

Int. Cl.[4] B42F *13/00, 3/04, 13/06*

U.S. Cl. 402—77 **6 Claims**



1. A notebook especially suited for student classroom note taking use and arranged for removably receiving and holding, looseleaf style, prepunched notebook paper in multiple sheet stack form, of which the sheets of the stack are of identical quadrilateral shape in accordance with a predetermined notebook paper dimensioning, and the binder holes of the paper stack are aligned and formed in spaced apart relation adjacent the left hand margin of the front side of the paper, for binding

purposes, in accordance with a predetermined notebook paper dimensioning,

said notebook comprising:

a front panel and a rear panel,

said panels each being quadrilateral in configuration and of substantially equal size, and proportioned to overlie, notebook fashion, the paper stack when the stack is held by the notebook,

with each said panel defining parallel upper and lower side edges along either side of same, inner edges that are in adjacency, and outer free edges,

with said inner and outer edges being disposed generally normally of the respective panel side edges,

a back panel intermediate said front and rear panels and articulated to the front panel along said inner edge of same and articulated to the rear panel along said inner edge of same,

said panels further each defining inner and outer side surfacings, and

a notebook paper binder device secured to the rear panel adjacent and along said inner edge of same for removably binding the notebook paper stack in the notebook,

said binder device comprising:

a rectilinear back strip substantially paralleling said inner edge of said rear panel and secured to said rear panel on said inner side surfacing of same,

said back strip having upper and lower ends respectively disposed adjacent the rear panel respective upper and lower side edges,

said back strip further having a first rectilinear post in upstanding relation thereto and adjacent to but spaced from said upper end thereof, and a second rectilinear post in upstanding relation thereto and adjacent to but spaced from said lower end thereof,

said posts having a spacing from each other and being located on said strip for separate reception in two of the prepunched holes of the notebook paper stack to locate and position the paper stack within the margins of the rear panel inner side surfacing when the paper stack is applied to said posts,

said posts each defining an upstanding free end,

said back strip upper end defining an end flange in upstanding relation thereto and having a flap articulated to the upstanding end of same for swinging between locked and unlocked positions relative to said first post in a plane that is substantially coplanar with the longitudinal dimension of said strip, with said flap thereof having a free end and snap fit lock means disposed for finger pressure induced snap fit locking engagement with and unlocking from said free end of said first post,

said back strip lower end defining an end flange in upstanding relation thereto and having a flap articulated to the upstanding end of same for swinging between locked and unlocked positions relative to said second post in said plane, with said flap thereof having a free end and snap fit lock means disposed for finger pressure induced snap fit locking engagement with and unlocking from said free end of said second post,

said panels being articulated together for closure of said front panel over said binder device and said rear panel in the notebook closed relation, wherein said binder device is enclosed within the notebook, and for opening of said front panel away from said rear panel for exposure of expose said binder device in the notebook open relation,

said back strip end flanges and said posts being in substantial parallelism and being similarly proportioned, normally of said back strip, to dispose said free ends of said flaps, respectively, above and below, respectively, said rear panel upper and lower edges when said flaps are articulated approximately one hundred eighty degrees in opposite directions away from their respective locked positions when said notebook panels are articulated to said notebook open relation,

whereby when said notebook panels are articulated to dispose the notebook in its said open relation, said binder device and flaps thereof are exposed and said flaps may be articulated to oppositely swing same in said plane from their snap fit locking engagement with the respective posts to dispose said flaps in their respective oppositely directed relations, to expose said posts for application of the notebook paper thereto, the notebook paper may be mounted in said notebook by reception of said posts in the similarly located binder holes of the paper, after which said flaps are swung in said plane back to, and are finger pressure biased into, their respective snap fit locking engagements with the respective posts to bind the notebook paper in the notebook, in which position said flaps overlie the paper bound in the notebook at the upper and lower margins of same, and on articulation of said Panels to dispose the notebook in its closed relation, said front panel overlies said binder device including said flaps thereof, and said binder device is enclosed within the notebook, and

should said notebook panels be articulated to dispose the notebook in its closed relation with said flaps disposed in their said oppositely directed relations, said free ends of said flaps are exposed exteriorly of the notebook to visually alert the user that said flaps are displaced from said locking engagement thereof with the said posts, respectively.

4,571,110

BALL JOINT

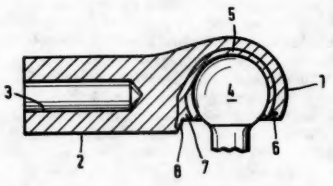
Hans Amrath, Viersen, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 591,148

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310489

Int. Cl.[4] F16C *11/10*

U.S. Cl. 403—141 **9 Claims**



1. A ball joint for connecting parts, the ball joint comprising

a ball socket made of flexible plastic, the ball socket being adapted to receive a ball head, and wherein

said ball socket has a wall section formed as a yoke-like part formed in one piece with another portion of the ball socket,

said yoke-like part is releasably engageable into said another portion of the ball socket together with the ball head therein,

said yoke-like part has a free end and is formed on said free end thereof with an anchoring head having a securing projection,

said another portion of said ball socket is formed with a recess and a detent,

said recess corresponds to said anchoring head, the latter being engageable into said recess,

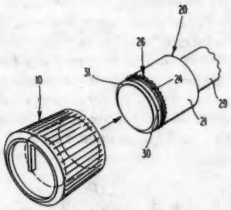
said securing projection is engageable into said detent,

said detent is a notch formed in said another portion of said ball socket adjacent said recess.

4,571,111
KNOB-TO-SHAFT ASSEMBLY

Kenneth D. Keogh, Wilmington, Del., assignor to Southco, Inc., Concordville, Pa.

Filed Jun. 17, 1983, Ser. No. 505,219
Int. Cl.[4] F16D *1/06;* B25G *3/14*
U.S. Cl. 403—282 3 Claims

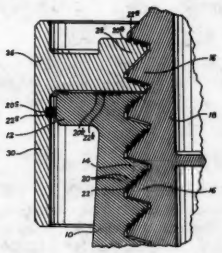


1. A knob-to-shaft assembly comprising:
(a) a knob of plastic material, said knob having a cylindrical recess at a rearward end;
(b) a shaft of metal material receiving said knob at a forward end, said shaft being generally cylindrical and having an annular V-shaped groove having inclined forward and rearward sidewalls near said forward end, said shaft having an outside diameter corresponding to that of the cylindrical recess of said knob;
(c) said shaft having an external peripheral band of continuous angled knurl on said inclined rearward sidewall of said V-shaped groove, the upper outer diameter of said angled knurl being larger than said outside diameter of said shaft, said larger diameter of said angled knurl being formed by an annular series of barbs each of which projects beyond the said outside diameter of said shaft, the lower inner diameter of said angled knurl being in said groove and being less than said outside diameter of said shaft.

4,571,112
JOINT ASSEMBLY

Louis W. Johnson, and Bruce G. Johnson, both of 2435 Prairie Rd., Eugene, Oreg. 97402

Continuation-in-part of Ser. No. 259,996, May 4, 1981, abandoned. This application Mar. 16, 1984, Ser. No. 590,174
Int. Cl.[4] F16G *11/00;* F16L *15/00*
U.S. Cl. 403—320 9 Claims

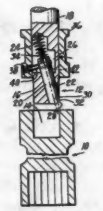


1. A joint assembly for a pair of members bearing a thrust load therebetween in a tightened working condition but arranged to be loosened from each other toward a non-working condition, said joint assembly comprising
(a) oppositely facing thread surfaces on respective ones of said members having different dimension for providing a space therebetween,
(b) first groove means in one of said surfaces having right angular defining walls,
(c) and insert means having a low coefficient of friction mounted in said first groove means,
(d) said insert means being rectangular in cross section and of a thickness greater than the depth of said first groove means for projecting from said first groove means when seated therein to project into said space and bear against a facing surface of the other member and maintain the two facing surfaces in spaced apart relation in a thrust working condition and to provide a reduced friction relation between the surfaces for allowing them to be readily moved between a working condition and a loosened non-working condition.

4,571,113
LOCKING JOINTS

Alfred S. Coren, 113 Hunnewell St., Needham, Mass. 02194

Filed Mar. 27, 1984, Ser. No. 593,912
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—322 9 Claims



1. A joint for coupling two members comprising a female member formed with a cavity defined by a complement of smooth, uninterrupted walls, an elongated stud of cross-section complementary with and sized loosely to enter the cavity and having a longitudinal axis, a guideway formed in the stud at an acute angle to the axis, a retainer slidable in the guideway and formed with an outer cavity-engaging end, spring means urging the retainer outwardly from the stud to occupy a normal position with its distal end outside the cross-section of the stud, means for causing the retainer to be withdrawn into the stud when the stud is embraced by the cavity, and means on the retainer for detachably engaging the smooth wall of the cavity when the members are interengaged.

4,571,114
STRAP CONNECTOR

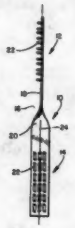
Carlos S. Rionda, and Joaquin J. Palacio, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Filed Jan. 24, 1983, Ser. No. 460,386
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—400 1 Claim

1. A structural joint including a pair of wooden structural members having faces disposed in different planes and a strap for joining said wooden members, said strap comprising:
(a) a first connecting plate disposed in a first plane, said first connecting plate having a plurality of rows of teeth projecting generally orthogonally from a surface of said first connecting plate, said teeth being embedded in a face of one of said wooden members;
(b) a second connecting plate disposed in a second plane that is not parallel to the first plane, said second connecting plate having a plurality of rows of teeth projecting generally orthogonally from a surface of said second connecting plate, said teeth being embedded in a face of another of said wooden members;
(c) a connecting strip having first and second ends with an intermediate section which is twisted, said first end being

joined to said first connecting plate and said second end being joined to said second connecting plate, said intermediate section being twisted approximately 90 degrees so that said first and second connecting plates are rotated approximately 90 degrees with respect to each other; and

(d) said first and second connecting plates having a common centerline which passes through the center of the first connecting plate, the axis of twist of the connecting strip and the center of the second connecting plate, the plurality of rows of teeth of said first and second connecting plates being sufficient in number and size to occupy a



major portion of said surface of each of said first and second connecting plates, said plurality of rows of teeth including, for each of said first and second connecting plates, a plurality of vertical rows of teeth which are equally spaced vertically and horizontally, said vertical rows including a center row which is bisected by said common centerline and with an equal number of vertical rows on either side of said center row, each row of teeth being formed of a plurality of pairs of teeth struck from the respective connecting plate with a longitudinal slot extending between the teeth of each pair of teeth.

4,571,115

CORNER JOINT LINK FOR PLATES, PARTICULARLY FURNITURE BOARDS

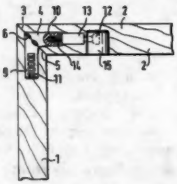
Gustav Erlebach, Boblingen; Roland Hölze, Oberschwandorf, and Gerhard Koch, Nagold, all of Fed. Rep. of Germany, assignors to Häfele KG, Fed. Rep. of Germany

Filed Aug. 15, 1984, Ser. No. 641,033

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1983, 3330584; Dec. 21, 1983, 3346067

Int. Cl.[4] F16B *13/00*

U.S. Cl. 403—402 **12 Claims**



1. A corner link for two plates to be fitted together in a miter joint, comprising an angle bolt having first and second shank portions disposed at an angle to each other, at least one stop formation disposed between said shank portions in the miter joint, said first and second shank portions extending into respective ones of the plates, said stop having a star-shaped configuration.

4,571,116

METHOD FOR SUPPRESSING DUST ON DIRT ROADS AND THE LIKE

Bhalchandra B. Patil, Reynoldsburg, and J. Matthew White, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 5, 1983, Ser. No. 520,788

Int. Cl.[4] E01C *7/36, 21/00;* **E02D** *3/12*

U.S. Cl. 404—76 **8 Claims**

1. In a method for suppressing the evolution of fugitive dust from a substrate which comprises applying to the exposed surface of said substrate an effective amount of a petroleum product emulsified in an aqueous medium, the improvement comprising employing as said petroleum product a composition consisting essentially of an emulsified blend of an asphalt having a viscosity at 165° F. of about 100 to about 1000 centipoises, a petroleum extender oil and a protective colloid.

4,571,117

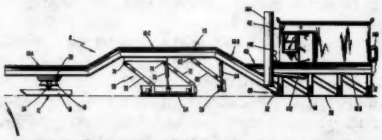
METHOD AND APPARATUS FOR FORMING AN ICE ROAD OVER SNOW-COVERED TERRAIN

Paul Johnson, deceased, late of Anchorage, Ak., and by Marie Johnson, administratrix, 2331 Captain Cook Dr., Anchorage, Ak. 99503

Filed Feb. 5, 1985, Ser. No. 698,532

Int. Cl.[4] E01C *21/00, 23/06, 23/14*

U.S. Cl. 404—77 **6 Claims**



1. Apparatus for forming an ice road over snow-covered terrain, comprising:

a mobile frame,

terrain support means mounted on said frame to support said frame upon the terrain as the frame advances,

a ridge forming means mounted on said frame for forming snow into a ridge extending along the path of travel of said frame, and

heating means mounted on said frame and arranged to pass along the ridge to form a slush of mixed water and snow of generally uniform depth and width which thereafter freezes, said heating means comprising:

a heating plate disposed behind said forming means, and including a bottom surface arranged in the path of the snow ridge and being inclined downwardly in a rearward direction, and

a heating compartment disposed above said heating plate and including means for applying heat to a top surface of said plate to heat said bottom surface such that contact between said bottom surface and the snow ridge causes snow to be melted.

4,571,118

SIMULATED TUBULAR HIGHWAY SAFETY DEVICE

Donald W. Schmanski, Carson City, Nev., assignor to Carsonite International Corporation, Carson City, Nev.

Filed Jan. 20, 1984, Ser. No. 572,366

Int. Cl.[4] E01F *9/00*

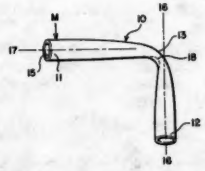
U.S. Cl. 404—10 **12 Claims**

1. A flexible, plastic structure simulating the distant appearance of a hollow plastic tube and having concurrent properties of (i) stiffness for maintaining a rigid, substantially straight tube orientation during static conditions; and (ii) resilient flexibility to enable deformation of said structure during dynamic conditions without elastic failure normally associated with a plastic tube when subjected to extreme, localized stress, this combina-

tion of conflicting properties being embodied in a simulated tube structure comprising:

a stiff, resilient, lightweight rod having values of elastic modulus (E) and moment of inertia (I) which (i) permit at least 90° deflection of said rod from a straight orientation in response to a bending moment (M) with resultant formation of a bending radius in the rod defined by the relationship R=EI/M and (ii) provide sufficient rigidity to the rod in static conditions to support the full length of the simulated tube in a straight tube orientation;

at least one unitary, elongated, resilient plastic bulb having lightweight structure of three integral parts configured



about a common longitudinal axis, including (i) a tubular body forming a midsection of the bulb having sufficient diameter to enable immediate visual observation at distances greater than 500 feet, and (ii) opposing closing surfaces at each end of the tubular midsection which respectively converge to an opening positioned on a line parallel to the common axis and having an opening size adapted to fit snugly around the rod, said bulb being inserted upon the rod and being adapted to cover all but opposing ends of the rod; and

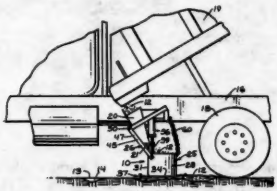
retaining means coupled at the opposing ends of the rod for retaining the mounted bulb in proper position thereon.

4,571,119

ROADWAY PATCHING ATTACHMENT FOR DUMP TRUCKS

James F. Jones, 16331 N. Tamarack La., Nine Mile Falls, Wash. 99026, and George O. Prufer, Rte. 2, Box 488, Deer Park, Wash. 99006

Filed Sep. 29, 1983, Ser. No. 537,726
Int. Cl.⁴ E01C *19/48*
U.S. Cl. 404—96 **20 Claims**



1. A roadway shoulder repair attachment for dump trucks having front and rear wheels, a roadway bulk material receiving dump bed and a chute leading downwardly from the dump bed between the front and rear wheels and substantially aligned with one of the rear wheels, for discharging the bulk roadway material from a discharge end thereof as the truck is moved forwardly; the attachment comprising:

a spreader blade;

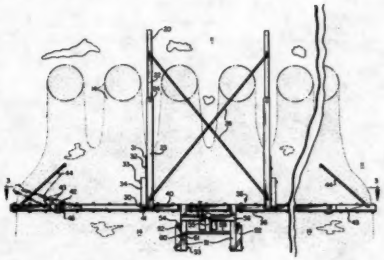
means for positioning the spreader blade at an operative position adjacent the chute discharge end forward of the one rear wheel such that material discharged from the chute is received ahead of the spreader blade along the roadway, and so the spreader blade will grade the material to a prescribed level in relation to the roadway surface as the associated truck is moved forwardly and so the one rear wheel will roll over and compress the material graded by the spreader blade as the truck is moved forwardly.

4,571,120

ROAD LEVELLING OIL SQUEEGEE

James D. Schoenhard, Morrison, Ill., assignor to International Technology Services, Morrison, Ill.

Filed Jan. 7, 1985, Ser. No. 689,331
Int. Cl.⁴ E01C *19/16*
U.S. Cl. 404—101 **2 Claims**



1. A road-levelling oil squeegee adapted for trailing behind a moving vehicle which distributes oil onto a roadway surface, for pooling oil to fill cracks and depressions in a roadway surface prior to spreading aggregate onto and tamping said aggregate into said oil to maintain and upgrade said roadway surface, the squeegee comprising:

an elongate, flexible blade means extending across said roadway surface and having a lower edge portion for engaging said oil forwardly thereof in said direction of motion, and for providing a level surface to said oil rearwardly of said blade;

support means for supporting and rigidifying said blade means vertically and horizontally except along said lower edge portion, where said blade means remains unsupported and flexible, the support means comprising a center portion having sideward ends and a pair of opposed, outer end portions, each of said outer end portions being pivotally connected to said center portion at said sideward ends thereof, whereby to allow adjustment of the effective width of the squeegee across the road surface and to entrap oil otherwise flowing sidewardly of the blade means from its center;

height adjustment means for engaging the roadway surface and carrying said blade means at any selected height above said roadway surface; and

drawing means for connecting said support means to said vehicle;

wherein the blade means further has rearwardly extended, partly looped means at each pivot connection for enabling said outer end portions to swivel forwardly and for blocking any excess flow of oil past said pivot connection.

4,571,121

UNDERWATER EROSION PREVENTION AND BACKFILL SYSTEM WITH BARRIER BAG INSTALLATION

Bruce J. Albert, 637 Petit Berdot, Kenner, La. 70065

Filed Mar. 1, 1984, Ser. No. 585,358
Int. Cl.⁴ E02B *3/00*; E02D *31/00*
U.S. Cl. 405—15 **15 Claims**

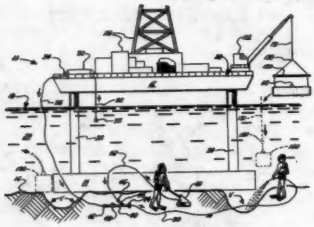
1. An underwater backfilling apparatus for use by divers comprising:

a. sediment intake means randomly movable by a diver for removing sediment material from the seabed which is to be used for backfilling;

b. handheld discharge means for dispensing sediment mate-

rial into a selected void space to be backfilled with the sediment material by a diver;

c. conduit means connecting the intake means and the discharge means with a bore so that sediment material can be transmitted from the intake means to the outlet means; and



d. fluid drive means positioned in the conduit means between the inlet means and outlet means for moving a mixture of sediment and seawater through the conduit.

4,571,122

PIPE LAYING APPARATUS

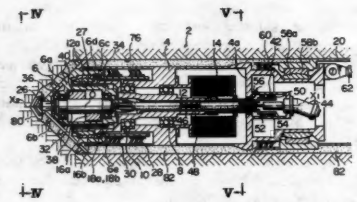
Hiroshi Yamamoto, Ibaraki; Shuichi Satoh, Sendai; Yoshiyuki Iwai, Takamatsu; Osamu Ae, Kyoto; Masao Suda, Tsuchiura; Minoru Shiozaki, Ibaraki; Kiyoshi Tsuchiya, Ibaraki; Manabu Nakano, Ibaraki; Kojiro Ogata, Ishioka; Naoki Miyanagi, Ibaraki; Kozo Ono, Toride, and Nobuyuki Tobita, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Hitachi Construction Machinery Co., Ltd., both of Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 655,528

Claims priority, application Japan, Feb. 24, 1984, 59-32691

Int. Cl.[4] F16L *1/00*

U.S. Cl. 405—184 **6 Claims**



1. A pipe laying apparatus comprising an excavator including an excavator body having a first axis, an excavating tool having a second axis and located at a forward end portion of the excavator body, and injection means formed in said excavating tool for injecting a viscosity imparting liquid into soil as excavated, and propulsion means located in a starting pit, said excavator body having a rearward portion thereof disposed adjacent pipes to be laid each having an outer diameter smaller than the outer diameter of said excavating tool and positioned at a rearward end thereof against said propulsion means, said excavating tool being operative to excavate the earth to form a hole therein while said viscosity imparting liquid is being injected through the injection means into the soil as excavated to thereby produce a viscosity imparting liquid containing soil which is conveyed rearwardly through an outer periphery of said excavator body while being filled in an annular clearance defined between the hole formed in the earth and the pipes to be laid, so that the pipes can be successively laid as the excavator body and the pipes propelled forwardly by said propulsion means; wherein said excavator comprises:

a first rotary shaft journalled in said excavator body for rotation about said first axis;

spherical surface seat means interposed between said excavating tool and first rotary shaft and having a sphere center located on the first axis, said excavating tool being supported through said spherical surface seat means on said first rotary shaft for allowing said excavating tool to swing in a pivotal movement about said sphere center with the second axis extending through the sphere center;

means interposed between said excavating tool and first rotary shaft for transmitting rotation of said first rotary shaft to the excavating tool while allowing the excavating tool to swing in a pivotal movement about the sphere center;

a second rotary shaft journalled in said excavating tool for rotation about said second axis;

a pair of eccentric weights mounted on said second rotary shaft and located symmetrically with respect to said sphere center while being displaced from each other by 180 degrees in phase;

first drive means connected to said first rotary shaft for driving thereof; and

second drive means connected to said second rotary shaft for driving thereof.

4,571,123

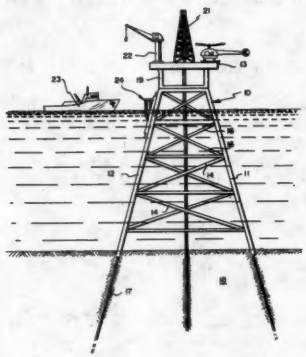
BOAT LANDING STAGE FOR MARINE PLATFORM

Tapan K. Chandra, Gretna, La., and Jonathan C. Major, Kyungman, Rep. of Korea, assignors to Texaco Inc., White Plains, N.Y.

Filed May 1, 1984, Ser. No. 606,084

Int. Cl.[4] E02B *3/22, 17/02*

U.S. Cl. 405—212 **7 Claims**



1. In a marine structure adapted for installation in an offshore body of water including; a jacket having a plurality of upstanding, spaced apart legs which support a deck above the water's surface, and means for fixing said jacket to the ocean floor at an offshore site, which structure includes;

an elongated tracking element **35** carried on each of at least two of said spaced apart legs, said tracking element extending for a distance above and below what will be the predetermined mean water level on said legs at said offshore site, said tracking element including; an elongated guide channel **42** having equispaced locating holes **45** aligned parallel with said tracking element longitudinal axis.

a boat landing substructure **24** which includes; a main column **28** slidably registered in said tracking element **35**,

a plurality of mounting brackets **29**, **30**, **31** depending from said main column **28**,

and locking means **49** adapted to releasably engage said main

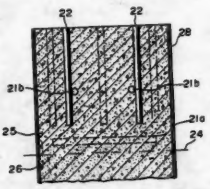
column 23 plurality of mounting brackets 29, 31 to said tracking element,

whereby, said boat landing substructure 24 can be slidably adjusted longitudinally of said elongated tracking element 35 to position said boat landing structure at a desired elevation with respect to the water's surface after said marine structure has been installed at said offshore site.

4,571,124
METHOD OF FORMING CAST-IN-PLACE CONCRETE PILE

Ichiro Matsui; Hiroaki Kobayashi, both of Tokyo, and Hideo Sano, Yokosuka, all of Japan, assignors to Sumitomo Cement Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,294
Claims priority, application Japan, Nov. 18, 1982, 57-201048
Int. Cl.[4] E02D *5/34*
U.S. Cl. 405—239 3 Claims



1. A method of forming a cast-in-place concrete pile which comprises the steps of:

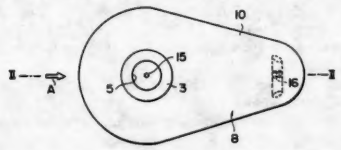
(a) mounting a plurality of tubes filled with a demolition-facilitating substance in an open top confined space above a predetermined level, said demolition-facilitating substance being in the form of a slurry; and

(b) subsequently pouring concrete into said confined space to cover said tubes to cast a concrete pile, so that said demolition-facilitating substance being adjusted in such a manner that said demolition-facilitating substance is caused to expand to rupture said tubes to produce cracks in the concrete pile above said predetermined level generally when the curing of said concrete is completed.

4,571,125
FLOATING OFFSHORE STRUCTURE

Masanao Oshima, Tokyo; Hitoshi Narita, Musashino; Nobuyoshi Yashima, Funabashi, and Hiroshi Tabuchi, Yokohama, all of Japan, assignors to Mitsui Engineering and Shipbuilding Company, Limited, Japan

Division of Ser. No. 478,327, Mar. 24, 1983. This application Mar. 15, 1985, Ser. No. 712,131
Claims priority, application Japan, Apr. 16, 1982, 57-63628; Apr. 16, 1982, 57-63629
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—224 4 Claims



1. A floating offshore structure for mooring at a fixed position on the sea by means of a mooring hawser having an anchor connected at the end thereof, for conducting a submarine excavating operation by an excavating drill pipe, comprising:

a hull;

a vertical through-hole formed in said hull;

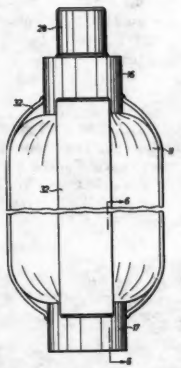
means for preventing floating objects such as broken ice from entering said vertical through-hole, comprising a tubular body projecting downwardly from a bottom of said hull substantially coaxial with said vertical through-hole such that the mooring hawser and the excavating drill pipe can be extended through said vertical through-hole and tubular body to the sea bottom, said tubular body in an operative position projecting below said hull bottom a sufficient distance to prevent said floating objects from entering said vertical through hole, but without reaching said sea bottom; and

means for suppressing oscillation of said floating offshore structure, comprising an overhanging member projecting radially outwardly from an outer periphery of a lower end of said tubular body.

4,571,126
EXPANSION BODY

Bengt P. O. Granström, Bromma, and Bo T. Skogberg, Handen, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 12, 1983, Ser. No. 560,124
Claims priority, application Sweden, Dec. 21, 1982, 8207291
Int. Cl.[4] E02D *5/28, 5/76*
U.S. Cl. 405—244 9 Claims



1. An expansion body for constructions located in soil, comprising:

a longitudinally folded open-ended casing (11) having a plurality of folds surrounding an interior space thereof;

sockets (16, 17) on the ends of the casing;

connecting means (32) coupled between said sockets and extending along the outside of the casing;

said casing (11) and said sockets (16, 17) forming a closed chamber interior of said casing;

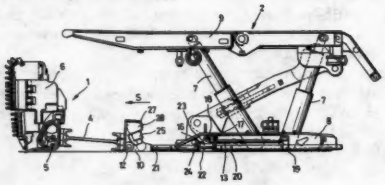
an inlet (28) connectable to a source to pressure fluid for pressurizing said closed chamber to expand and develop said folds of said casing between said sockets; and

a sealing agent (31) in said sockets for preventing fluid leakage between said casing and said sockets.

4,571,127
ADVANCE MECHANISM FOR MINE ROOF SUPPORT UNITS

Gerhard Merten, and Günter Lagodka, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,636
Int. Cl.[4] E21D *15/44, 23/08*
U.S. Cl. 405—299 **9 Claims**

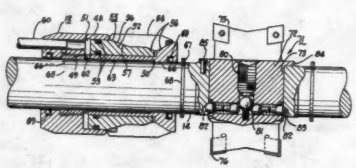


1. In a mineral mining installation comprising a longwall conveyor, a plurality of roof support units positioned side-by-side on the goaf side of the conveyor, each roof support unit having a floor sill, and a respective advance mechanism positioned between the floor sills of each pair of adjacent roof support units, each advance mechanism comprising a pair of generally parallel guide rods and a pair of generally parallel hydraulic advance rams, the guide rods of each advance mechanism being interconnected at one end by a head-piece attached to the conveyor, and the guide rods of each advance mechanism being slidably guided in guides attached to the two adjacent floor sills, the improvements comprising positioning the guide rods of each advance mechanism beneath the associated hydraulic rams, connecting said guide rods together by a bridge positioned between the associated head-piece and the other ends thereof, providing the floor sills associated with said guide rods with brackets positioned between said bridge and said other ends of said guide rods, and pivotally mounting each of said associated hydraulic rams between a respective one of said brackets and said bridge.

4,571,128
I. D. HELIX GROOVING HEAD

Charles A. Ogden, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 28, 1982, Ser. No. 372,502
Int. Cl.[4] B23B *35/00*
U.S. Cl. 408—1 R **4 Claims**



1. Method of cutting an interior helical groove in a tubular work piece with a helix grooving head,

said head comprising a body having a distal end and a proximal end, said body being connected at its proximal end to a boring bar adapted to be rotated about an axis, the projection of said axis through said body defining the axis of the body, said body having a plurality of sockets therein each having a cutter, received therein, said cutters having tips protruding from said sockets said sockets being uniformly axially and circumferentially less than 360° spaced apart relative the axis of the body,

said method comprising rotating the work piece about its tubular axis, introducing said head axially into said tube, and advancing the bar axially at a speed s (feet per minute where

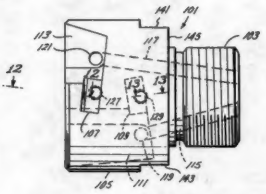
$$s=(d)(\text{rpm})(360)/x$$

and d is the axial separation of the cutter tips in feet, rpm is the revolutions per minute of the work piece, and x is the angle in degrees between the tips of the cutters measured about said axis.

4,571,129
MANDREL ASSEMBLY

Kevin O. Strand, Garfield Heights, Ohio, assignor to Erickson Tool Company, Solon, Ohio

Filed Nov. 13, 1984, Ser. No. 670,947
Int. Cl.[4] B23B *41/10*
U.S. Cl. 408—54 **24 Claims**



1. A mandrel assembly for clamping on the inner surface of a clamping aperture to journal a rotatable tooling bar comprising, in combination:

an elongated rotatable tooling bar of a diameter smaller than the clamping aperture and adapted to have a cutting tool rotatable therewith;

a mandrel in said mandrel assembly and having a body;

an air pressure expansible chamber in said mandrel body;

an expanding collet carried on said mandrel body;

force transfer means connected between said expansible chamber and said collet;

an annular journal surface rotatable with said tooling bar;

an annular bearing surface on said mandrel body in close proximity to said annular journal surface, and

means connected to said mandrel body adapted to supply air under pressure to the annular space between said annular journal and bearing surfaces to establish an air bearing of said tooling bar in said mandrel body, and to supply air into said expansible chamber to expand said expanding collet against the inner surface of the clamping aperture to clamp the mandrel within the clamping aperture.

4,571,130
REAMER WITH SELF LOCKING GUIDE MEMBERS

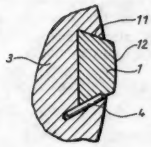
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to MAPAL Fabrik für Präzisionswerkzeuge, Dr. Kress KG, Aalen, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,932
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307398
Int. Cl.[4] B23B *51/00*; B23D *77/02*
U.S. Cl. 408—143 **8 Claims**

1. In a reamer comprising a cutter head rotating about an axis and at least one elongated guide member, the improvement means comprising

means comprising an elongated recess in said cutter head extending in a direction substantially parallel to said axis for self-locking said guide member in a predetermined position relative to said cutter head upon insertion of said guide member in said elongated recess, said elongated

recess having a first lateral surface leading said elongated recess in the direction of rotation of said cutter head and



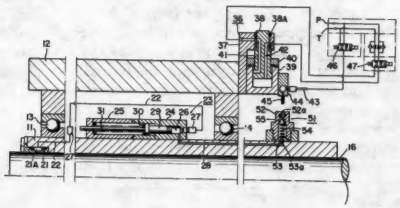
further comprising a plurality of elastic elements inserted in said cutter head and passing through said lateral surface to said elongated recess.

4,571,131

DEVICE FOR CLAMPING BORING BAR IN HORIZONTAL BORING AND MILLING MACHINE

Takao Date, Shizuoka, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1984, Ser. No. 577,012
Claims priority, application Japan, Feb. 15, 1983, 58-20687[U]
Int. Cl.[4] B23C *1/02*
U.S. Cl. 409—209 **2 Claims**



1. A device for clamping a boring bar in a boring and milling machine, comprising:

a milling spindle rotatably supported by a ram through bearings;

a boring bar rotatably and reciprocatably supported in an internal bore of said milling spindle;

a resilient clamping ring inserted between the milling spindle and the boring bar and having a recess provided along an outer circumference thereof;

a first oil passage extending along a longitudinal axis of the milling spindle and connected with said recess of said clamping ring;

an accumulator mounted on an outer surface of said milling spindle and provided with an oil chamber connected with said first oil passage and a second oil passage extending through said milling spindle, and a piston urged toward said oil chamber by a spring;

a receiving unit including a valve casing secured to an outer portion of said milling spindle, an internal space thereof communicating with said second oil passage, a valve member movable in said casing, and a spring urging the valve member toward a needle inserting hole provided for said casing so as to prevent oil from flowing out of said casing through the needle inserting hole; and

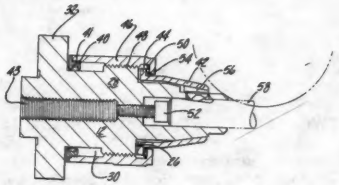
an oil supply unit including a supporting member secured to one side of said ram, a cylinder reciprocatable in said supporting member under application of pressurized oil, a stationary piston contained in said supporting member, and an oil supply needle secured to said cylinder, said oil supply needle being insertable into and withdrawable from said needle inserting hole during reciprocating movement of said cylinder, said oil supply needle, when inserted into said needle inserting hole, supplying pressurized oil to the oil chamber of said accumulator through said valve member and said second oil passage.

4,571,132

COLLET ASSEMBLY

Lothar P. Bunge, 26648 Ryan, Warren, Mich. 48091

Filed Jun. 17, 1982, Ser. No. 389,205
Int. Cl.[4] B23C *5/26*; B23B *31/04*
U.S. Cl. 409—234 **29 Claims**



1. Acollet for releasably holding a tool shaft of the type having an indexing depression in the surface thereof, comprising:

an elongate core having a bore in one end thereof for receiving said tool shaft therein and including a tapered outer surface adjacent said one end;

a retainer extending transversely through said core and shiftable into a locking position within said depression for preventing rotation of said shaft relative to said core;

a sleeve longitudinally slidable over said core and engageable with said retainer for holding said retainer in said locking position thereof, said sleeve including a tapered inner surface complementally engageable with said outer surface of said core;

means for selectively preventing longitudinal sliding movement of said sleeve whereby to maintain said sleeve in a selected longitudinal position thereof holding said retainer in said locking position thereof; and,

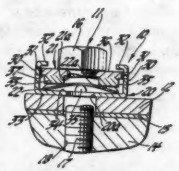
means mounting one end of said sleeve for free floating radial movement relative to said core.

4,571,133

LOADING WASHER ASSEMBLY

Dale W. Lindow, Marine City, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 23, 1984, Ser. No. 633,695
Int. Cl.[4] F16B *31/04, 39/24*
U.S. Cl. 411—11 **3 Claims**



1. A loading washer assembly including an annular first washer provided with spaced apart ears on its outer peripheral edge, an annular second washer provided with spaced apart notches on its outer peripheral edge for slidably receiving said ears whereby to prevent relative rotation of said washers, each of said ears having return bent free end portions extending over said second washer whereby to limit the axial extent of separation of said washers, each of said first and second washers on their opposed surfaces having circumferentially spaced apart, radial extending raised ribs with said ribs on said first

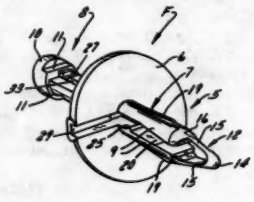
washer rotatively offset from said ribs on said second washer, and a normally flat spring ring interposed between said first washer and said second washer in position to be engaged by said ribs whereby said spring ring can be deformed into a wave-like spring upon axial displacement of said first washer toward said second washer.

4,571,134

TWO-PIECE PLASTIC FASTENER AND APPARATUS FOR MOLDING SAME

Gregory O. Beglinger, Woodstock, Ill.; Edward P. Massof, Brighton, Mich., and Richard J. Schwind, Akron, Ohio, assignors to Phillips Plastics Corporation, Phillips, Wis.

Filed Apr. 6, 1983, Ser. No. 482,526
Int. Cl.⁴ F16B *13/04*
U.S. Cl. 411—41 **4 Claims**



1. As an article of manufacture, a one-piece molded plastic fastener (F) comprising: a grommet (5), a pin (8) insertable into said grommet (5), and an integral frangible web (31) securing said grommet (5) and pin (8) together;

said grommet (5) comprising a head (6) having a front surface and a rear surface and a pair of laterally spaced apart resilient legs (9) projecting forwardly from said front surface,

said head (6) having a groove (29) in said front surface that extends radially inwardly from the periphery of said head (6) and defines a pin-receiving hole in said head (6), said hole having a rear end,

said head (6) having a wall portion defining the rear side of said groove (29) and bridging said groove (29),

said (9) legs having a pin-receiving slot (20) of predetermined width and depth between them which is open at its sides and communicates with said pin-receiving hole in said head (6),

said groove (29) being at least as wide as said slot (20) and extending radially inwardly from the periphery of said head (6) beyond the depth of said slot (20),

said pin (8) having a front end surface (32) which defines a portion of said rear end of said pin-receiving hole in said head;

said frangible web (31) being thinner than either of said head (6) and said wall portion and extending between and integral with said head (6) and said pin (8),

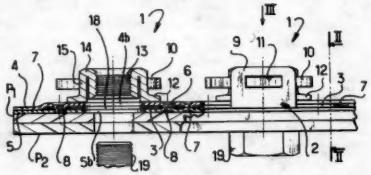
said web (31) having a rear surface which is complanar with the rear side of said wall portion and with a portion of said rear surface of said head (6), said web having a front surface which is coplanar with said front end surface (32) of said pin (8) and defines another portion of said rear end of said pin-receiving hole in said head (6).

4,571,135

ENCAGED NUT

Joël Martin, Saint Cosme en Vairais, and Maxime Boire, Charville, both of France, assignors to Simmonds S.A. and Societe Nationale Industriele et Aerospatiale, both of, France

Filed May 23, 1984, Ser. No. 613,199
Claims priority, application France, May 31, 1983, 83 09034
Int. Cl.⁴ F16B *27/00, 41/00*
U.S. Cl. 411—85 **2 Claims**



1. An encaged nut, comprising

said nut,

a substantially U-shaped support retaining said nut and comprising a base provided with a plurality of holes therethrough,

an upper strip of synthetic material and a lower strip of synthetic material confining said base therebetween, said strips adapted to be attached to an element, prepared by the method comprising the steps of

disposing a respective strip of synthetic material on opposite sides of said base of said substantially U-shaped support,

at least one of compressing and heating said two strips to cause the same to adhere to one another along at least a portion of an external periphery of said base and in the region of said holes through said base, which is thus sandwiched between said two strips, and

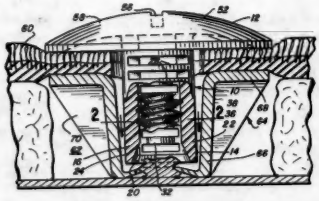
mounting said nut on said substantially U-shaped support.

4,571,136

PLASTIC PUSH-ON FASTENER

Brian R. Peek, Steger, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 10, 1984, Ser. No. 579,054
Int. Cl.⁴ F16B *37/16*
U.S. Cl. 411—437 **13 Claims**



1. A one-piece plastic fastener fastener adapted for mounting on a threaded stud comprising a head portion and a generally axially extending cylindrical body portion having at least one cylindrically extending rib section formed by a series of spaced apart arcuate segments, each of said arcuate segments having the opposite ends integrally formed with an axially extending solid cylindrical wall segment and having the length of each arcuate segment between said opposite ends free to flex, said cylindrical body portion having retaining means formed internally thereof for ratcheting over the threads of said threaded stud upon said cylindrical body portion being pressed onto said

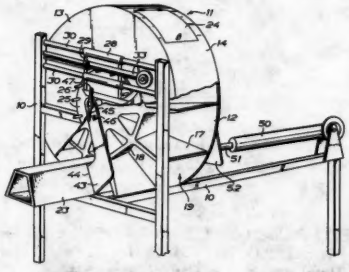
stud and thereafter threadedly engaging said threads, said retaining means including a resilient wing member integrally formed on a plurality of said arcuate segments and extending inwardly of said body portion such that at least the tips of said wing members engage the threads of said threaded fastener.

4,571,137

DEVICE FOR SUPPLYING SOLID FUEL TO A FURNACE

Bengt-Göran Malmgren, Åkarp, Sweden, assignor to HB BGM Innovation, Sodervagen, Sweden

Filed Jan. 28, 1983, Ser. No. 461,757
Claims priority, application Sweden, Jan. 29, 1982, 8200499
Int. Cl.[4] F23K *3/00*
U.S. Cl. 414—173 **2 Claims**



1. A device for supplying solid fuel to a furnace comprising a cell wheel rotatable about a substantially horizontal axis, for receiving fuel portions in the cells which are open axially and available for filling at a position in the path of rotation of the cell wheel, two stationary end walls, said cell wheel being rotatably mounted between said end walls which form two openings facing each other axially, for uncovering a through passage through a cell located between said openings, said openings being dimensioned so as to uncover the total cross section of the cell, and an outlet socket on one of said end walls at the opening therein, a drive mechanism, including a pawl and ratchet mechanism with a ratchet on the cell wheel coaxially aligned with the axis therefor, and a slide reciprocal in the transverse direction of the axis, which carries a drive pawl for co-operation with the ratchet, connected to the cell wheel for rotating the cell wheel step by step to locate the cells one after the other opposite to said openings, a reciprocable transfer means at the side of the cell wheel where the other end wall is located, which is displaceable through the cell located between the openings and through the outlet socket for supplying the fuel received by the cell through the socket, and a displaceable shut-off member for shutting off the passage through the outlet socket and which is operatively connected with the slide to be moved to an opened position by an operative stroke of the slide and to a closed position by a return stroke of the slide, said shut-off member as to the displacement thereof being co-ordinated with the movement of the transfer means to shut off the passage through the socket when the transfer means is withdrawn.

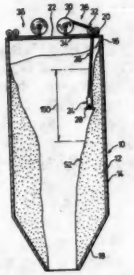
4,571,138

APPARATUS FOR SILO CLEAN OUT

David Farajun, 31 Clansman Blvd., Willowdale, Ontario, Canada (M2H 1X5)

Filed Apr. 9, 1984, Ser. No. 598,203
Int. Cl.[4] B65G *65/48*
U.S. Cl. 414—323 **22 Claims**

1. An apparatus for cleaning out material which remains within a storage area of a silo or the like, said apparatus comprising a power driven means for impacting said material, to loosen the material and allow it to fall downwardly of said storage area; means for suspending said impacting means from above said material in said silo and supplying power to said impacting means; said suspension/power means being sufficiently flexible to permit swinging movement of said impacting means about said storage area within said silo; a drum supported from a roof for said silo above said material in said silo



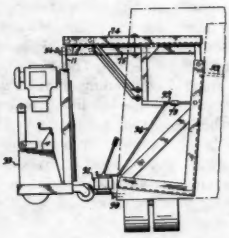
about which said suspension/power means is wound, drive means for rotating said drum to pay out or rewind said suspension/power means in positioning said impacting means in the area of said material to reciprocate thereby said impacting means along a face of said material.

4,571,139

SELF-PROPELLED FREIGHT HANDLING TRUCK

John F. Moseley, Ormond Beach, Fla., and Stephen R. Austin, Winnetka, Ill., assignors to Superior Handling Equipment, Inc., Ormond Beach, Fla.

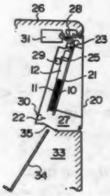
Continuation-in-part of Ser. No. 295,783, Aug. 24, 1981, Pat. No. 4,435,113. This application May 3, 1983, Ser. No. 491,019
The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.
Int. Cl.[4] B66F *9/08*
U.S. Cl. 414—347 **13 Claims**



1. A freight transport system comprising a highway transport truck for transporting interiorly thereof a driver, packaged freight, and a self-propelled freight handling forklift truck for transporting said freight from said highway transport truck to a delivery destination, said highway transport truck including means for transporting said self-propelled forklift truck in a collasped condition, said self-propelled forklift truck including a frame having a pair of parallel vertical rails, wheels mounted on said frame for transporting said truck, liftting forks mounted on said rails to move upwards and downwards and selectively to be collapsible against said rails, internal combustion power means for generating power to propel said truck and to raise, lower, and tilt said lifting forks, at least one of said wheels being a driving wheel rotated by said power means, two horizontally pivoted legs with a freely rotating wheel at the forward end of each leg telescopically attached to extend or retract longitudinally from each leg, hydraulic power means

to pivot said legs and to extend or retract said wheels, and a tiller guiding means attached to said driving wheel for manually guiding said truck, said tiller being selectively collapsible by folding against said frame.

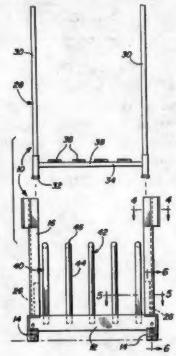
4,571,140
EXTRACTING DEVICE FOR EXTRACTING CONTENTS FROM BAG-LIKE CONTAINER
Sadami Yamada, and Kaoru Tamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Nov. 6, 1984, Ser. No. 668,883
Claims priority, application Japan, Nov. 9, 1983, 58-210531
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—412 **4 Claims**



1. An extracting device for extracting contents from a flexible bag-like container comprising a setting table movable between a bag placing position in which said flexible bag-like container is placed on the setting table and an extracting position in which the bag-like container is removed from the contents therein, drawing means for drawing the bag-like container away from the contents, and a housing with respect to which the setting table is moved between the bag placing position and the extracting position, the setting table and the housing forming a light-shielded chamber when the setting table is in the extracting position, the drawing means consisting of first and second members respectively carried by the setting table and the housing so that the first and second members are opposed to each other with a portion of the bag-like container near one end thereof intervening therebetween to associate with each other to draw the bag-like container from the contents thereof when the setting table is moved to the extracting position, wherein the improvement comprises that the first and second members are at least a pair of drivable gears which are meshed with each other with the portion of the bag-like container intervening therebetween.

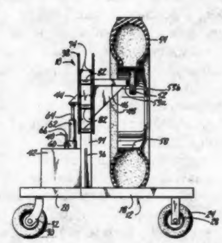
4,571,141
PALLET UNLOADING FIXTURE
Clarence L. Gieson, Proctor, Vt., assignor to Metromail Corporation
Filed Apr. 19, 1984, Ser. No. 601,962
Int. Cl.[4] B66F *9/19*
U.S. Cl. 414—417 **4 Claims**

2. The combination with a pallet supporting a non-rigid, vertically stacked load and mobile fork lift means for transporting the loaded pallet, frame means for enclosing a vertically elongated handling zone, means fixed to the frame means for guiding lowering of the pallet into the handling zone by the fork lift means to a rest position, rail means fixedly mounted by the frame means and projecting through the pallet during said lowering thereof by the fork lift means for establishing a supporting plane, intersecting the handling zone, above which the load is retained, means for guiding elevation of the fork lift means through the handling zone above said supporting plane, and means mounted on the frame means and engageable with



the load for stabilizing the load during said elevation of the fork lift means withdrawing the load from the handling zone.

4,571,142
MECHANISM FOR LIFTING VEHICLE TIRES
Jack L. Niewald, P.O. Box 224, Clinton St., and Eugene W. Kelch, Rural Rte., both of Corwith, Iowa 50430
Filed Feb. 13, 1984, Ser. No. 579,349
Int. Cl.[4] B66F *5/00*
U.S. Cl. 414—427 **12 Claims**



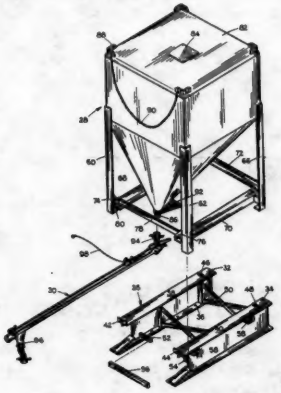
1. A device for lifting, supporting, lowering and transporting a vehicle tire having a rim comprising:
- a base framework having ground-contacting means to allow said device to be easily moved along the ground;
- a mast extending upwardly from said base framework;
- a masthead which is adjustably securable to said mast and which may be moved along said mast;
- an extension means; said extension means comprising a laterally extending arm extending outwardly from said masthead and having an outer end and a longitudinal axis;
- a vehicle tire contacting means secured to said outer end of said arm of said extension means comprising tandem wheels rotatably mounted in a mounting means, said tandem wheels being coplanar and close together but spaced apart laterally with respect to said longitudinal axis of said extension means a distance no greater than the inside diameter of said rim, said tandem wheels being contactable with the interior of said rim of said vehicle tire and allowing rotation of said tire when said wheels are in contact with said rim; and
- jack means on said base framework operably connected to said masthead for selective raising and lowering of said masthead which in turn raises and lowers said vehicle tire when engaged with said vehicle tire contacting means.

4,571,143

MEANS FOR TRANSPORTING AND DELIVERING DRY CHEMICALS

Gary L. Hellerich, R.R. 1, Box 131, Valparaiso, Nebr. 68065

Filed Apr. 12, 1984, Ser. No. 599,343
Int. Cl.[4] B60F *1/40, 1/64*
U.S. Cl. 414—523 **4 Claims**



1. In combination,

a support frame means for mounting on a wheeled frame means having a flat support bed,

said support frame means comprises a pair of spaced-apart beams having bottom edges adapted to lie on the support bed and a pair of raised support surfaces disposed in vertically spaced relation above said bottom edges,

a dry chemical supply hopper means selectively removably mounted on and secured to said support frame means and positioned thereabove whereby an empty hopper means may be replaced on said support frame means with a filled hopper means,

said hopper means having a chemical discharge means at its lower end,

said hopper means further comprising a support leg means having a pair of generally horizontally disposed support members adjacent the lower end thereof, which support members have bottom surfaces positioned for registration with said raised support surfaces upon mounting of said hopper on said support frame means whereby said discharge means is positioned in spaced relation above the bottom edge of the support frame means,

coacting abutment means on said support frame means and hopper means for horizontally securing said hopper means in its registered position on the support frame means,

and a delivery conveyor means selectively removably connected to said chemical discharge means for conveying the dry chemical outwardly therefrom.

4,571,144

TAILGATE RAMP FOR ATTACHING TO THE TAILGATE OF A TRUCK

Donald C. Guidry, 1233 Haig St., Baton Rouge, La. 70802, and Ronald H. Guidry, 12010 Section Rd., Port Allen, La. 70767

Filed Aug. 4, 1983, Ser. No. 520,496
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—537 **4 Claims**

1. a loading ramp foldable inside of the tailgate of trucks having tailgates comprising:

a. a truck tailgate having an inside and an outside;

b. a first rectangular ramp section pivotally connected to the inside of said tailgate;

c. a second rectangular ramp section pivotally connected to each side of said first ramp section by a first and a second rigid bar means,

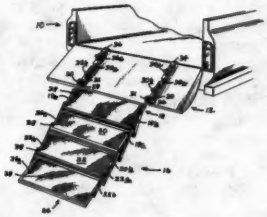
i. said first rigid bar means being rotatably pinned to the middle of the sides of said first ramp section and to the side of the upper end of said second ramp section;

ii. said second rigid bar means being rotatably pinned to the side of the lower end of said first ramp section and to the middle of the side of said second ramp section;

d. a third rectangular ramp section pivotally connected to each side of said second ramp section by said second rigid bar means and by third rigid bar means,

i. said second rigid bar means being rotatably pinned at its lower end to the upper end of the side of said third ramp section,

ii. said third rigid bar means being pinned to the side of the



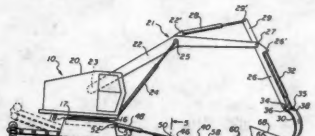
lower end of said second ramp section and to the middle of the side of said third ramp section, said rectangular ramp sections having a height less than the height of said tailgate to enable said ramp to be folded inside said tailgate without extending above said tailgate, said ramp sections having two parallel shorter sides and two parallel longer sides, said longer sides being parallel to the rear edge of said tailgate, said rectangular ramp sections having a metal grating connected to the edges thereof for supporting cargo being loaded on said tailgate, one of the longer edges of said rectangular ramp sections being adjacent to one of the longer edges of an adjacent rectangular ramp section when said foldable ramp is unfolded and extended to load cargo, said adjacent rectangular ramp sections forming a continuous inclined roadway when extended to load cargo.

4,571,145

COMBINATION HANDLING AND CONVEYING APPARATUS

Roy D. Hunter, 2829 Texas Ave., Texas City, Tex. 77590

Division of Ser. No. 148,822, May 12, 1980, Pat. No. 4,379,672.
This application Apr. 8, 1983, Ser. No. 483,233
Int. Cl.[4] B65G *41/00*
U.S. Cl. 414—567 **18 Claims**



1. An apparatus for handling loose materials such as gravel, sand or the like, comprising

a generally inverted U-shaped chassis having an upper horizontal base surface,

vehicle drive means carrying said generally inverted U-shaped chassis for providing ground support and propulsion therefor,

a platform rotatably mounted on said upper horizontal base surface of said chassis,

means for horizontally rotating said platform with respect to said chassis and vehicle drive means,

an elongated articulated boom means mounted on said platform for rotation therewith and for longitudinal extension beyond said chassis and vehicle drive means, said boom means having a free extending end,

longitudinally extendable conveyor means mounted on said chassis below the level of said platform and adapted for limited arcuate vertical movement with respect thereto, said conveyor means including

a generally rectangular cradle member,

suspension means cooperating with said chassis and said cradle member for suspending said cradle member from said chassis and permitting at least limited arcuate vertical movement therebetween,

conveyor assembly disposed longitudinally in said cradle member and cooperating therewith for permitting longitudinal movement with respect thereto, said conveyor assembly having a loading end projecting from said cradle member and said chassis,

driving means for moving said conveyor assembly longitudinally with respect to said cradle member and moving said loading end longitudinally with respect to said chassis, and

positioning means cooperating with said cradle member and said chassis for arcuately moving said cradle member in a vertical plane with respect to said chassis and positioning said longitudinally movable loading end into contact with the loose materials for cooperating with said free extending end of said boom means, and

material handling means mounted on said free extending end of said boom means and cooperating with said conveyor assembly loading end for moving the materials unto said conveyor means.

4,571,146

DIGGING APPARATUS APPLICABLE TO A BUCKET LOADER

Ingemar Eriksson, Pl. 1166, Sjövik, Sweden (440 07)

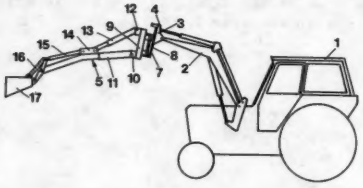
PCT No. PCT/SE83/00224, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04277, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 3, 1983, Ser. No. 577,621

Claims priority, application Sweden, Jun. 4, 1982, 8203459

Int. Cl.[4] B66C *23/00*; E02F *3/76*

U.S. Cl. 414—687 **4 Claims**



1. A digging apparatus applicable to a bucket loader, such as a tractor loader and of the type used for smaller digging work, such as in agriculture, park management or the like, and incorporating a connecting device intended to be interconnected to said bucket loader and with a pivot axle connected thereto and extending mainly perpendicularly to the extension of a digging beam, which is pivotably supported about the pivot axle and has an overhead stay bar, and a bucket attached to the free end thereof, which bucket is operable by means of a driving device, and having at least one hydraulic piston adapted to bring about the pivoting of the digging beam about the pivot axle and arranged to transfer pivot force to the digging beam at a short distance from the pivot axle, characterized thereby, that the digging beam and the stay bar are both designed as telescopic tubular profiles, which are individually adjustable in length by aid of individually operable attachment members in order easily to adapt the apparatus for attachment to different bucket loaders and for rapid adjustment of the geometry of the digging beam in relation to varying digging conditions and positions, wherein the digging beam is bent downwards at its outer end.

4,571,147

SHOVEL EXCAVATOR WITH MODIFIED UPPER CARRIAGE DESIGN

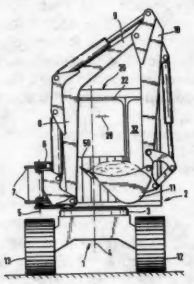
Hans Schaeff, Langenburg, Fed. Rep. of Germany, assignor to Karl Schaeff GmbH & Co. Maschinenfabrik, Langenburg, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,642

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325405

Int. Cl.[4] E02F *3/32*

U.S. Cl. 414—694 **12 Claims**



1. A mobile shovel excavator comprising:

(a) an undercarriage having a fore-and-aft axis and lateral boundaries;

(b) a polygonal upper carriage pivotable 360° about a vertical axis and positionable in at least a travel position and a main excavating position and upper carriage having a front edge including a lateral projection disposed adjacent one side of said upper carriage and an operator cab eccentrically mounted on said upper carriage opposite said lateral projection said operator cab having a front side eye level zone;

(c) a lateral projection vertical axis mounted to said lateral projection;

(d) an attachment holder pivotally mounted about said lateral projection vertical axis; and,

(e) a shovel assembly comprising a first angled boom portion, a second angled boom portion, a shovel post, and a shovel said shovel assembly being positionable in a travel position defining a central clear space substantially coincident with said eye level zone.

4,571,148

MANIPULATING UNIT

Pavel J. Drazan, Cardiff, United Kingdom, assignor to National Research Development Corporation, London, England

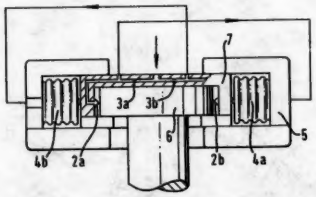
PCT No. PCT/GB83/00075, § 371 Date Oct. 25, 1983, § 102(e) Date Oct. 25, 1983, PCT Pub. No. WO83/03217, PCT Pub. Date Sep. 29, 1983

PCT Filed Mar. 14, 1983, Ser. No. 551,998

Claims priority, application United Kingdom, Mar. 15, 1982, 8207517

Int. Cl.[4] B66C *1/00*; B25J *11/00*

U.S. Cl. 414—730 5 Claims



1. A system for holding and manipulating an article, the system comprising a housing in which there are: a member connected to means for holding the article; position sensing means for sensing the position of the member in the housing; and actuating means connected to the sensing means for producing movements of the member within the housing, wherein the position sensing means comprises: a sensor member having a nozzle; a first gas line with constricting means for supplying gas to the nozzle via the constricting means, the nozzle being disposed opposite the first member, whose position is to be sensed; and a second gas line, connected to the first gas line between the nozzle and said actuating means, the arrangement being such that, if the said first member moves towards or away from the nozzle, the gas pressure at the constricting means increases or decreases respectively, causing gas to flow towards or away from the actuating means via the second gas line to cause the actuating means to cause movement of the said first member.

4,571,149

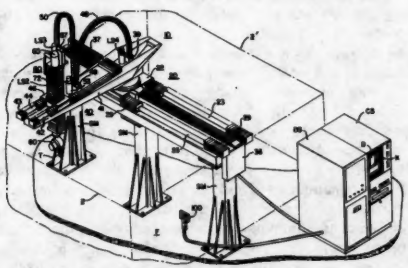
GENERAL PURPOSE ORTHOGONAL AXES MANIPULATOR SYSTEM

Daniel P. Soroka, Imperial, and Mark S. Stoutamire, Carnegie, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1983, Ser. No. 485,076

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—750 18 Claims



1. A gantry type orthogonal axis manipulator system exhibiting machine tool design features which permit off-line programming in Cartesian coordinates using conventional numerical control techniques, comprising:

X, Y and Z axis assemblies, each assembly including a guide means, a carriage means coupled to the guide means and a drive means for controlling the travel of the carriage along said guide means, said assemblies being operatively coupled to form an orthogonal axis manipulator system;

means for supporting said orthogonal axis manipulator system in an elevated position above a first work area, such that X axis assembly is maintained in a fixed elevational position by the supporting means;

said guide means of said X and Y axis assemblies including a horizontally disposed dual guide rail system to provide rigidity and minimize deflection resulting from torsional-type bending modes during the travel of the carriage means along the guide means;

the Y axis assembly being coupled to said X axis carriage means and including a Y axis support arm extending from said axis carriage means and supporting the guide means and carriage means of said Y axis assembly, wherein the Z axis assembly is coupled to said Y axis carriage means and includes a vertically disposed dual guide rail system to provide rigidity and minimize deflection resulting from torsional-type bending modes during the travel of the carriage means along the guide means;

said drive means of each assembly including a mechanical drive means connected to the respective carriage means and a DC servo motor means with resolver feedback in a closed loop configuration coupled to said mechanical drive means to cause said carriage means to traverse the respectivee guide means in response to carriage position signals;

rotary index means for horizontally rotating said Y axis assembly about said X axis carriage at the end of travel of said X axis carriage on the guide means of said X axis assembly from a first position serving said first work area on one side of said X axis assembly to at least a second position on the opposite side to serve a second work area in response to a rotary control drive signal, and

control means connected to the DC servo motor means of the drive mean of said X, Y and Z axes assemblies to provide said carriage position signals to control of the movement of the respective carriage means, and connected to said rotary index means to provide said rotary control drive signal.

4,571,150

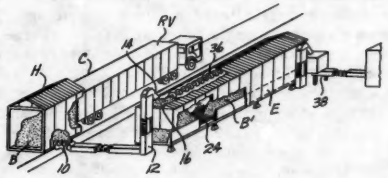
RECIPROCATING FLOOR CONVEYOR METHOD

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Division of Ser. No. 364,864, Feb. 2, 1982, Pat. No. 4,492,303. This application Aug. 20, 1984, Ser. No. 642,200

Int. Cl.[4] B65G *65/34*

U.S. Cl. 414—786 3 Claims



1. A method of handling bulk material from a road vehicle to a point of use, comprising:

providing the vehicle with a storage compartment for the bulk material which includes a reciprocating floor conveyor, operable for discharging the bulk material out from said storage compartment through a rear opening in the compartment;

discharging such bulk material from the storage compartment in the vehicle, by operation of the reciprocating floor conveyor, into a receiving housing having an inlet sized to receive a rear portion of the storage compartment carried by the vehicle;

conveying the bulk material from the receiving housing to an elevated inlet at one end of an elongated storage enclosure;

subjecting the bulk material to the receiving end of an elevated conveyor within said enclosure as it is added to said enclosure;

providing said enclosure with a reciprocating floor conveyor for advancing the bulk material to an outlet from said enclosure at the end thereof opposite the elevated inlet; operating the reciprocating floor conveyor for advancing bulk material to said outlet; and

operating the elevated conveyor at a higher longitudinal conveying speed than that of said floor conveyor for distributing newly added bulk material through the enclosure, from the inlet of the enclosure to the trailing end of an advancing deposit of the bulk material within the enclosure to thereby eliminate gaps in the advancing material formed by uneven feed at said inlet; and

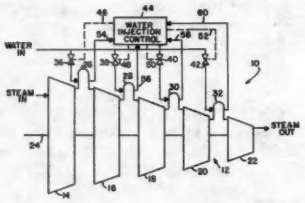
conveying the bulk material out from the outlet end of the storage enclosure to a point of use, as needed.

4,571,151

LIQUID INJECTION CONTROL IN MULTI-STAGE COMPRESSOR

Duane B. Paul, Leominster, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Aug. 26, 1983, Ser. No. 526,664
Int. Cl.⁴ F01D *17/08*
U.S. Cl. 415—1 **9 Claims**



1. Apparatus for controlling interstage liquid injection into a fluid flowing in a multi-stage compressor, comprising:

means for measuring a fluid pressure in said interstage;

means for calculating a saturation temperature of said fluid based on said fluid pressure and,

control means effective to control a flow rate of said liquid injection at an upstream end to a value which reduces a temperature of said fluid at a downstream end of said interstage to a predetermined amount above said saturation temperature.

9. A method for controlling interstage water injection into a steam flowing in a multi-stage compressor, comprising:

measuring a pressure of steam in said interstage;

calculating a saturation temperature of said steam based on said pressure; and

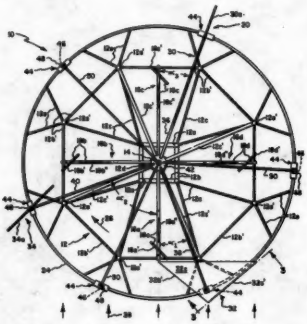
controlling a flow rate of said water injection at an upstream end to a value effective to reduce a temperature of said steam at a downstream end of said interstage to a predetermined amount above said saturation temperature.

4,571,152

VERTICAL AXIS WINDMILL

Frank J. Tatar, 6808 Lake Shore Rd., Derby, N.Y. 14047

Filed Oct. 31, 1983, Ser. No. 546,903
Int. Cl.⁴ F03D *7/06*
U.S. Cl. 415—4 **3 Claims**



1. A vertical axis windmill comprising in combination:

a tower;

an output shaft supported by said tower for rotation about a vertically disposed axis;

a power conversion means coupled to said output shaft;

a plurality of horizontally disposed spars fixed for rotation with said output shaft and arranged to extend radially thereof;

a plurality of vertically disposed wind reaction panels carried at least one on each of said spars;

a wind vane assembly freely rotatable relative to said drive shaft and said tower, said assembly including a first wind deflecting device comprised of a pair of vertically extending panels joined to define a V-shaped unit having its apex arranged to face towards the wind, wherein a first panel is arranged to direct oncoming air radially outwardly of said spars away from said wind reaction panels, during those portions of the rotational movement of said spars relatively towards the wind, a second wind deflecting device cooperating with said second panel for channeling oncoming air towards said wind reaction panels, during that portion of the rotational movement of said spars relatively away from the wind, and a wind vane cooperating with said first and second wind deflecting devices for maintaining same in desired, relatively stationary operative positions relative to the direction of the oncoming wind, and said first panel is provided with a through opening extending from adjacent the juncture of said first and second panels, an auxiliary panel supported for movement between opening closed and open conditions, and means for normally maintaining said auxiliary panel in an opening closed condition, while permitting movement thereof into open condition in response to predetermined high wind loading condition thereon to allow oncoming air to flow through said first panel into motion retarding engagement with said wind reaction panels during rotational movement of said spars relatively towards the wind.

4,571,153

AXIAL-ADMISSION STEAM TURBINE, ESPECIALLY OF DOUBLE-FLOW CONSTRUCTION

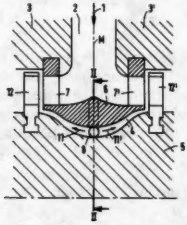
Herbert Keller, Müilheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Müilheim, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 475,458

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209506

Int. Cl.[4] F01D *25/12, 1/08*

U.S. Cl. 415—117 6 Claims



1. Axial-admission steam turbine, comprising a steam inflow region for receiving inflowing steam, a shaft being rotatable in a given direction, an annular shaft shield being disposed in vicinity of said steam inflow region deflecting the inflowing steam from the radial to the axial direction of said shaft, said annular shaft shield surrounding said shaft at a distance defining a ring canal therebetween, said annular shaft shield having means for cooling the entire periphery of said shaft with an expanded steam layer surrounding the periphery of said shaft, said shaft periphery-surrounding cooling means being in the form of passageways formed in said shaft shield for discharging a portion of steam exclusively from the inflowing steam into said ring canal tangentially relative to said shaft as seen in said given direction of rotation of said shaft.

4,571,154

DEVICE FOR ADJUSTING THE TURBINE INLET FLOW CROSS-SECTION OF AN EXHAUST GAS TURBOCHARGER

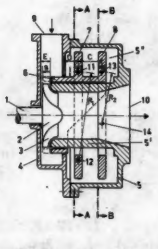
Jürg Weber, Turgi, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 21, 1984, Ser. No. 623,240

Claims priority, application Switzerland, Jun. 29, 1983, 3560/83

Int. Cl.[4] F01D *17/12*

U.S. Cl. 415—158 4 Claims



1. In a device for adjusting the turbine inlet flow cross-section of an exhaust gas turbocharger consisting essentially of an adjustment element movable in the axial direction by an amount (S), which adjustment element is located in the turbine flow duct upstream of the rotor blades, and of a mechanism for actuating the adjustment element, the improvement comprising the adjustment element being suspended by two annular linkage levers located concentric to the turbine axis, the lever arm (R_1) of the first annular linkage lever nearer to the turbine being longer than that (R_2) of the second annular linkage lever and that, by this means, a trapezoidal four bar linkage located in a plane including the turbine axis is produced, the lengths of the lever arms (R_1,R_2), the axial distance between them (C) and the distance (D) between the first annular linkage lever and the point of the adjustment element to be sealed being so matched that the path of the adjustment element departs minimally from the straight translatory movement of the latter.

4,571,155

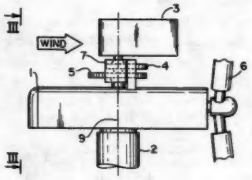
WIND TURBINE YAW STABILIZER

Lloyd G. Angeloff, North Merrick, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 2, 1984, Ser. No. 595,973

Int. Cl.[4] F03D *7/04*

U.S. Cl. 416—13 9 Claims



1. A yaw stabilizer device for an equipment unit rotatably mounted on a support structure, said yaw stabilizer device comprising;

a support structure;

an equipment unit rotatably mounted on said support structure;

a vane pivotally mounted atop said equipment unit for free rotation with the wind;

a cam affixed to and rotatable with said vane;

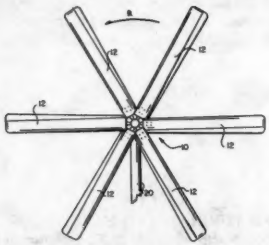
a toothed wheel stationarily affixed to said support structure; and

pawl means mounted atop said equipment unit in operative proximity with said cam and said toothed wheel, said pawl means comprising first and second pawls mounted atop said equipment unit on substantially diametrically opposite sides of said cam, said pawls extending symmetrically to a substantially vertical plane through the axis of said cam whereby when said first of said pawls engages said toothed wheel it prevents rotation of said equipment unit in a clockwise direction and permits rotation of said equipment unit in a clockwise direction and permits rotation of said equipment unit in a counterclockwise direction and when said second of said pawls engages said toothed wheel it prevents rotation of said equipment unit in a counterclockwise direction and permits rotation of said equipment unit in a clockwise direction, whereby when said vane rotates to align itself with a new wind vector, said cam rotates with said vane and disengages one of said pawls from said toothed wheel thereby permitting said equipment unit to rotate in the direction of rotation of said vane until said equipment unit is aligned with said vane, at which point said cam permits both said pawls to engage said tooth wheel, locking said equipment unit in aligned position with said wind.

4,571,156
AIR FOIL WITH TRAILING SPOILER

Francis M. Penterman, Pine River, Wis., assignor to D. C. Research, Inc., Appleton, Wis.

Filed Mar. 5, 1984, Ser. No. 586,039
Int. Cl.⁴ F03D *7/04*
U.S. Cl. 416—132 B **16 Claims**



1. An air foil for extracting rotational mechanical energy from wind, comprising:

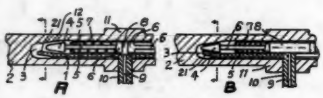
a blade means having an elongated rigid main body that is provided with a leading edge and a trailing edge that are substantially parallel with the longitudinal axis of the elongated main body; and

a flexible and resilient sheet forming a trailing spoiler that is adjacent the trailing edge so that a flexing portion of the sheet extends past the trailing edge, laterally from the elongated main body, the flexing portion bends towards the wind when said air foil is overspeeding to limit rotational speed of the air foil thereby preventing overspeeding.

4,571,157
PROPELLER WITH AN INTERIOR ARRANGEMENT TO VARIATE THE PITCH

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 308,202, Oct. 2, 1981, Pat. No. 4,452,411. This application Apr. 11, 1983, Ser. No. 483,977
Int. Cl.⁴ B64C *11/38*
U.S. Cl. 416—158 **1 Claim**



1. A propeller consisting substantially of a rigid single body, having a medial portion and two arms of propeller blades which extend substantially radially from said medial portion, one of said arms in one radial direction and the other of said arms in the thereto opposed other radial direction, with said arms having cross-sectional areas which form airfoil sections while said medial portion of said propeller is borne by a revolvable shaft which has a passage communicated with its first end to a fluid under pressure and with its other end to a space which is provided in said medial portion of said propeller to supply fluid under pressure into said space in said medial portion;

wherein each of said arms is provided individually with a cylinder and a piston reciprocable in said cylinder;

wherein said pistons are subjected temporarily and in unison to a variable pressure in fluid which is supplied by said fluid under pressure through said shaft;

wherein said arms are of slightly plasticly deformable material in the plastically deformable range of said material by which said material provides a resistance against deformation;

wherein said pistons on said cylinders are used in unison to act at equal times against said resistance to overcome portions of said resistance to slightly deform said arms, by which to change the inclinations and thereby the angles of attack of said airfoil sections of said arms of said propeller,

wherein said propeller is provided with an interior space which extends from said medial portion into said arms,

wherein said cylinders and pistons are located in said interior space,

wherein said pistons are subjected to springs which are located in said interior space and force said pistons towards the middle of said interior space,

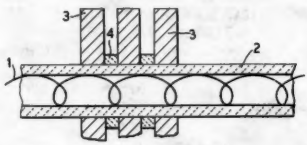
wherein said fluid from said shaft is supplied into said cylinders medially inwards of said pistons and acts contrary directed to said action of said springs against said springs, and;

wherein relative inclined walls are provided on said interior spaces and portions of shafts of said pistons which meet said inclined walls, by which to thrust under said pressure in said fluid against said inclined walls thereby to bow the outer portions of said arms of said propeller while said arms return under their inner stresses to their unbowed configuration when said pressure decreases.

4,571,158
GETTER SORPTION PUMP WITH HEAT ACCUMULATOR FOR HIGH-VACUUM AND GAS DISCHARGE SYSTEMS

Heinz Maegdefessel, Haslach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,353
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332606
Int. Cl.⁴ F04B *37/02*
U.S. Cl. 417—51 **8 Claims**



1. In a getter sorption pump for high-vacuum and gas discharge systems having at least one getter member formed of a non-evaporating getter material, and a corresponding heating element, the improvement comprising:

said heating element being disposed within an interior of a heat accumulating insulating tube comprising ceramic; and

a plurality of individual getter members each extending radially outwardly of, completely surrounding, and being externally attached to said insulating tube and spaced from one another.

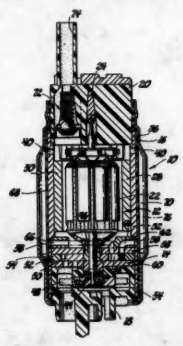
4,571,159
FUEL PUMP WITH INTEGRAL ACCUMULATOR

John M. Beardmore, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1985, Ser. No. 708,023
Int. Cl.⁴ F04B *35/04, 11/00*
U.S. Cl. 417—366 **3 Claims**

1. A fuel pump comprising: a pump portion; a motor means for driving said pump portion; said motor means including a flux carrier; a resilient membrane member surrounding said

flux carrier; a shell member surrounding said resilient membrane member and including a portion radially spaced from said resilient membrane member; said pump portion having discharge means in fluid communication with said resilient membrane member between said resilient membrane member and said flux carrier for discharging high pressure fluid



thereto, said resilient membrane member being responsive to the pump discharge fluid pressure to expand into the space provided by said portion radially spaced from said resilient membrane member in response to high pressure fluid to thereby provide an accumulator for the pressure discharge of said pump portion.

4,571,160

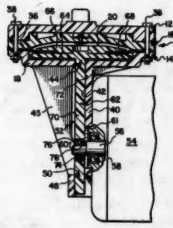
DIAPHRAGM PUMP HAVING A FLAT PLATE ACTUATING MEMBER SLIDABLE IN SLOTS

Robert D. King, Garland, and James M. Henderson, Plano, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 24, 1984, Ser. No. 633,836

Int. Cl.[4] F04B *43/02*; F01B *19/02*

U.S. Cl. 417—437 **5 Claims**



1. For use with a motor having an eccentrically rotating drive shaft, a diaphragm pump comprising:

a housing forming a pump chamber;

inlet and outlet valve means communicating with said chamber for connecting said chamber to a fluid system;

diaphragm means positioned within said chamber and attached to said housing;

rod means having a head attached to said diaphragm and including a substantially flat plate portion extending from said head through said housing, said plate portion having an aperture shaped to matingly receive an eccentrically rotating drive shaft pin in a slip fit such that orbital motion of an engaged pin imparts a corresponding orbital motion to said plate portion, and said plate portion may be displaced in a direction parallel to a rotational axis of an associated eccentric drive shaft and not transmit a thrust load thereto; and

said housing including slot means having upper and lower slots slidably receiving said plate portion therethrough at upper and lower ends thereof and shaped to constrain displacement of said plate portion in said orbital motion to a single plane substantially perpendicular to a rotational axis of an associated eccentric drive shaft, whereby said head imparts a rocking motion to said diaphragm and the transmission of thrust and torque loads from said rod means to an engaged drive shaft is substantially eliminated.

4,571,161

PUMP/NOZZLE UNIT FOR FUEL INJECTION IN INTERNAL COMBUSTION ENGINES

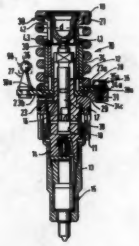
Jean Leblanc, Lyons; Jean Pigeroulet, Villeurbanne, and Francois Rossignol, Mornant, all of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,233

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411407

Int. Cl.[4] F02M *47/00*

U.S. Cl. 417—499 **9 Claims**



1. A pump/nozzle unit for fuel injection in internal combustion engines comprising:

(a) a pump housing receiving a piston-type injection pump provided with an injection nozzle at one end thereof;

(b) a pump piston axially guided in a cylindrical bore in the pump housing said pump piston being rotatable by means of a regulating sleeve disposed coaxially therewith in order to vary an effective supply stroke and actuable via a drive tappet counter to force exerted by a tappet spring;

(c) a guide bushing secured on the pump housing and provided with a sleeve-like guide part for said drive tappet and an end face forming an axially positional securing means for the regulating sleeve;

(d) an extremity face being provided on the drive side on the pump housing;

(e) an actuation flange being provided on the pump housing at least indirectly engaged by securing means for securing the pump/nozzle unit to the engine;

(f) said guide bushing being provided with a bushing flange protruding radially outward beyond an outer diameter of the tappet spring, said bushing flange being provided with an end face resting on said extremity face on the drive side of the pump housing and extending into a region provided adjacent the extremity face for engagement by said securing means of the pump/nozzle unit;

(g) said bushing flange being secured on the pump housing by a holder means;

(h) said holder means for the guide bushing being arranged to pass through an oblong slot in the bushing flange of the guide bushing and be secured to a securing flange of the pump housing;

(i) said regulating sleeve being provided with a radially protruding control lever arm associated with a control lever arm regulating means;

(j) said guide bushing having a flange area in which is disposed a recess provided as a circular segmented ring in which a cutaway is provided allowing passage therethrough of said control lever arm, said recess being fur-

ther provided with lateral limiting edges defining a maximum pivoting range for said control lever arm in at least one pivoting direction; and

(k) said flange of said guide bushing provided with at least one oblong slot for receiving said holder means, said at least one oblong slot being arranged to allow said guide bushing to be slightly rotatable within a limited range of movement, whereby

adjustment of a fuel supply quantity provided by said pump/nozzle unit is faciliated.

4,571,162

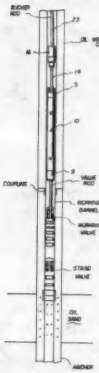
OIL WELL SUCKER ROD SHOCK ABSORBER

Floris B. Knox, Robinson, Ill., assignor to Ira M. Patton, Lawrenceville, Ill.

Continuation of Ser. No. 402,417, Jul. 28, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 708,108

Int. Cl.⁴ F04B *21/04*; F16F *9/00*

U.S. Cl. 417—554 **1 Claim**



1. An oil well sucker rod shock absorber comprising, in combination: an outer cylindrical casing defined by a cylindrical wall and having a removable upper plug means and lower plug means disposed respectively at upper and lower extremities of said casing, said upper plug means having an axial bore and said lower plug means defining a closed lower end and having an upwardly facing top surface; plunger rod means connected to said sucker rod and being slidably disposed in the bore of said upper plug means, a piston within said cylindrical casing and coupled to said plunger rod means and having a downwardly facing bottom surface; biasing means having a maximum vertical length disposed vertically within said casing and extending between said downwardly facing surface of said piston and said upwardly facing surface of said lower plug means at all times for allowing vertical reciprocal translation of said plunger rod means and said piston within said cylindrical casing downwardly against said biasing means; a plurality of apertures disposed through said cylindrical casing along the entire length thereof opposite the length of the biasing means, allowing downhole fluid pressure to be applied to said piston within said cylindrical casing via said apertures to be added to the force of the biasing means, without causing a fluid lock within the cylinder, whereby slap and wear of the sucker rod resulting therefrom are reduced and damage thereto prevented.

4,571,163

AXIAL CLEARANCE ADJUSTMENT MECHANISM FOR SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

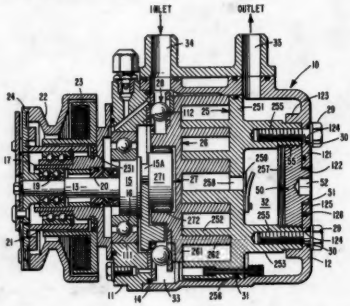
Seiichi Sakamoto, and Kiyoshi Terauchi, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 8, 1984, Ser. No. 587,467

Claims priority, application Japan, Mar. 15, 1983, 58-36346[U]

Int. Cl.⁴ F01C *1/04, 21/10*

U.S. Cl. 418—55 **7 Claims**



1. In a scroll-type fluid displacement apparatus including a housing, a fixed scroll fixedly disposed relative to said housing and having a first end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having a second end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least a pair of sealed off fluid pockets, driving and rotation preventing means operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll while preventing rotation thereof to thereby change the volume of the fluid pockets, and means for adjusting and setting the axial clearance between the axial ends of said wraps and said scroll end plates, the improvement wherein the clearance adjusting means comprises:

first axial guide means supported on the interior of said housing and projecting axially from said housing;

second axial guide means supported on the exterior of said fixed scroll member and projecting axially from said fixed scroll member, said first and second guide means interfitting with one another and being relatively axially slidable to permit axial movement of said fixed scroll member relative to said housing while maintaining the end plates of said scroll members parallel;

fixed scroll member positioning means operatively coupled to said fixed scroll member and accessible from the exterior of said housing to axially move and position from fixed scroll member relative to said housing; and

locking means accessible from the exterior of said housing for releasably locking said fixed scroll member in a preselected axial position, thereby setting said axial clearance.

4,571,164

VANE COMPRESSOR WITH VANE BACK PRESSURE ADJUSTMENT

Tsunenori Shibuya; Yutaka Ishizuka; Haruhiko Takada; Teruo Nakamura, and Hidehiko Takayama, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 502,666, Jun. 9, 1983, abandoned. This application Mar. 25, 1985, Ser. No. 715,770

Claims priority, application Japan, Jun. 18, 1982, 57-91163[U]

Int. Cl.⁴ F04C *18/00, 29/02*

U.S. Cl. 418—76 **1 Claim**

1. A vane compressor comprising:

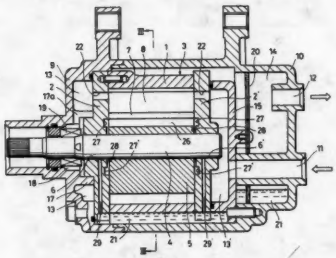
(a) a compressor body including a cylinder of an oval-shaped

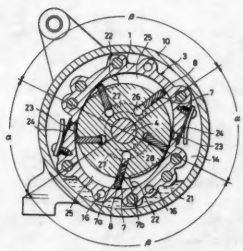
cross section having an inner peripheral surface including a smaller-diameter portion, said cylinder having two diametrically opposite pump outlets and opposite axial ends, and a pair of side blocks secured to said axial ends of said cylinder and having opposite inner end surfaces;

(b) a rotor rotatably mounted in said compressor body and having opposite end surfaces facing said inner end surfaces of said side blocks, said rotor carrying a plurality of vanes slidably fitted therein, said rotor having a plurality of vane slits in which said vanes are slidably received, and a plurality of back-pressure chambers defined therein and surrounded by respective ones of said vanes and said side blocks, said back-pressure chambers each having opposite axial ends opening in said opposite end surfaces of said rotor;

(c) an oil sump in which oil is stored under a high pressure;

(d) said opposite axial ends of each said back-pressure chambers being disposed to follow a path against each of said opposite inner end surfaces of said side blocks, said path being divided into two diametrically opposite high-pressure zones in which said vanes move across said pump





outlets, and two diametrically opposite normal-pressure zones, said high pressure-zones and said normal-pressure zones being circumferentially arranged alternately with each other, said high pressure zones each extending angularly from a trailing end of said back-pressure chamber positioned when an extension of a leading side of the vane slit is located immediately in front of an opening edge of an associated one of said pump outlets toward a leading end of the back-pressure chamber positioned when a trailing side of the vane slit has just moved past said smaller-diameter position of said inner peripheral surface of said cylinder;

(e) said opposite inner end surfaces of said side blocks each having two diametrically opposite oil grooves defined therein and disposed to communicate with said back-pressure chambers, said oil grooves each extending along a substantially whole circumferential size of an associated one of said normal-pressure zones;

(f) restrictor means communicating with said back-pressure chambers, said restrictor means comprising clearances between said side blocks and said rotor;

(g) said rotor having a coaxial drive shaft, said side blocks of said compressor body having a pair of bearing holes, respectively, in which said drive shaft is rotatably journalled, clearances between said drive shaft and said bearing holes acting to throttle oil flowing therethrough, said side blocks having oil guide grooves defined in said opposite inner end surfaces thereof and communicating between said oil grooves and said bearing holes;

(h) said side blocks having oil supply holes defined therein and communicating between said bearing holes and said oil sump whereby oil fed through said oil supply holes to said bearing holes is then guided at a restricted flow rate through said clearances between said bearing holes and said drive shaft to said oil guide grooves;

(i) wherein while said axial ends of each said back-pressure chambers are following said normal-pressure zones as said rotor rotates, said oil grooves are in communication with said back-pressure chambers to introduce oil in said oil grooves into said back-pressure chambers, and while said axial ends are following said high-pressure zones, said back-pressure chambers are out of communication with said oil grooves, whereby the oil in said back-pressure chambers is confined therein while being compressed therein, except that a fraction of the oil is leaked through said restrictor means.

4,571,165

ROTOR HOUSING FOR ROTARY PISTON ENGINES

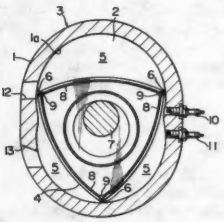
Yoshinori Murata, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 30, 1984, Ser. No. 635,527

Claims priority, application Japan, Aug. 29, 1983, 58-158251

Int. Cl.[4] F01C *1/22*

U.S. Cl. 418—178 **2 Claims**



1. A rotor housing for rotary piston engines, which has an inner wall formed with a first layer of chromium plating, and a second layer of nickel-fluorine resin composite plating formed on said first layer, said second layer of composite plating including 9 to 40 vol. % of fluorine resin particles dispersed in nickel matrix and having a thickness of 5 to 25 microns, said fluorine resin particles having a particle size of 0.3 to 3 microns, such that said second layer has a nature of establishing an intimate relationship with apex seals of the rotary piston engine when the second layer is brought into a sliding engagement with the apex seals.

4,571,166

CONTROL SLIDE FOR A SCREW VOLUMETRIC MACHINE AND A MACHINE EQUIPPED THEREWITH

Bernard Zimmern, 27 rue Delabordère, Neuilly-sur-Seine 92200, France

Filed May 4, 1983, Ser. No. 491,474

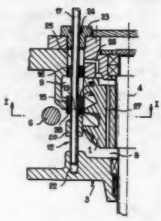
Claims priority, application France, May 12, 1982, 82 08235

Int. Cl.[4] F01C *3/08, 1/08*

U.S. Cl. 418—195 **2 Claims**

1. A volumetric machine, comprising an hour-glass screw having a cylindrical outer profile, rotatably mounted inside a leak-tight cylindrical casing and engaging a plane pinion-wheel

in order to create chambers with a variable volume, each of said chambers being defined by walls of two consecutive threads, an inner wall of the casing and one face of one tooth of the pinion-wheel; one low pressure port provided through the casing near one end of the screw; one high pressure port provided near the other end of the screw; and means for varying the capacity of the machine at a substantially constant volumetric ratio, said capacity varying means comprising a slide flush with the wall of the casing and mounted in a groove of the casing parallel to the axis of the screw, so as to vary the high pressure port, and to vary, remote from the high pressure port, a recess communicating with the low pressure port, wherein the slide comprises a body which is adjacent the high



pressure port and one spacer of predetermined thickness having substantially the same outer profile as the body and removably secured to the body at one end thereof directed towards the low pressure port, and means for removing and replacing said one spacer with another spacer of a different predetermined thickness, whereby movement of said slide including said one spacer of predetermined thickness varies the capacity of the machine at a first substantially constant volumetric ratio, and substitution in said slide of said other spacer of different predetermined thickness changes the volumetric ratio of the machine so that a slide including said other spacer varies the capacity of the machine at a substantially constant volumetric ratio different from said first substantially constant volumetric ratio.

4,571,167

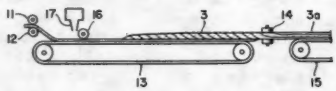
APPARATUS FOR SCORING AND COILING FISH PASTE

Shobun Goto, Shiogama; Jiro Sugihara, Miyagi, and Masayoshi Yabusaki, Shiogama, all of Japan, assignors to Kabushiki Kaisha Kibun, Tokyo, Japan

Division of Ser. No. 630,760, Jul. 13, 1984. This application Mar. 27, 1985, Ser. No. 716,386

Int. Cl.[4] A01J *21/02*; A21C *3/00*

U.S. Cl. 425—289 **4 Claims**



1. An apparatus for shaping fish-paste products from fish paste materials, comprising, in combination:

a pair of cooperative rolls provided with cutting blades and operating to clamp therebetween a traveling paste sheet of specific width an indefinite length and to form incision lines or grooves in the lengthwise direction of the sheet on at least one surface thereof;

conveying means for supporting the sheet emerging from between said rolls and for causing the sheet to travel in the lengthwise direction thereof, the sheet, while thus traveling, being subjected to tension applied to the leading or downstream end thereof and being spirally and obliquely curled into a curled body having a lateral edge of the sheet as a core and extending obliquely to the sheet traveling direction and outward beyond the opposite lateral edge of the sheet;

guide post means disposed with its axis perpendicular to the surface of the sheet at a position on or outside of the extension line of said opposite lateral edge and functioning to inflect the path of travel of said curled body wrappingly passed therearound from the oblique direction to a direction substantially parallel to the sheet travel direction, the curled body thereby being shaped into a rolled-up article; and

tensioning means for applying a drawing force to said rolled-up article thereby to apply aforesaid tension and cause the curled body to travel around and past the guide post means.

4,571,168

APPARATUS FOR THE COMPRESSION OF GRANULAR MATERIAL

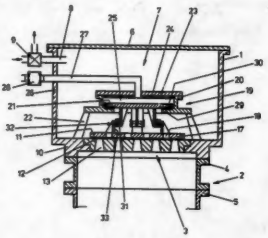
Hans Tanner, Schaffhausen, and Kurt Fischer, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Nov. 28, 1984, Ser. No. 675,716

Claims priority, application Switzerland, Nov. 30, 1983, 6394/83

Int. Cl.[3] B29C *5/00*

U.S. Cl. 425—405 R **12 Claims**



1. Apparatus for the compression of granular molding materials comprising

a pressure vessel connected to a source of pressurized compressive medium;

a valve system in said pressure vessel;

a molding chamber containing said granular materials and communicating with said valve system;

said valve system including a valve seat having at least one traversing opening therethrough and a valve plate; said plate having at least one traversing opening arranged so as to allow covering and uncovering of said opening in said seat;

a lifting mechanism operatively connected to said valve plate and to a source of pressurized fluid; and

means for adjusting pressure on said plate to decrease pressure thereof against said valve seat to allow pressurized compressive medium to flow through and around said valve plate and into said molding chamber to compress said materials therein.

4,571,169

MOLD CLAMP APPARATUS FOR MOLDING MACHINE

Yoshiharu Shima; Masaaki Miyahara, both of Ueda; Nobuyuki Nakamura, and Kaoru Yanagisawa, both of Toguramachi, all of Japan, assignors to Nissei Plastics Industrial Co., Ltd., Japan

Filed Dec. 18, 1984, Ser. No. 682,931

Claims priority, application Japan, Dec. 21, 1983, 58-241766

Int. Cl.[4] B29C *45/67, 45/56*

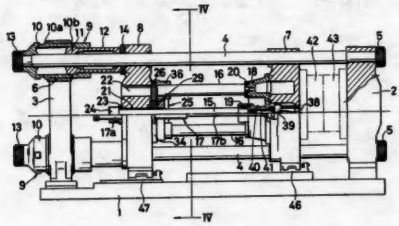
U.S. Cl. 425—451.9 **5 Claims**

1. A mold clamp apparatus for a molding machine compris-

ing: a fixed platen provided on a base mount; four parallel tie bars an end of each of which is fixed to each of four corners of said fixed platen; a movable platen penetrated by said each tie bar and opposite said fixed platen; and a hydraulic unit provided behind said movable platen for moving said movable platen relative to said fixed platen and for performing a mold-opening/closing operation of mold halves mounted on said fixed platen and said movable platen respectively and a powerful mold-clamping operation of said mold halves, characterized by further comprising:

a bearing platen penetrated by an end of said each tie bars and provided movably behind said movable platen;

four mold clamp cylinders each of which is provided with a cylinder member and a mold-clamping ram both of which are penetrated by the outher end of said each tie bar, said cylinder member being connected to the other end of said each tie bar, and said mold-clamping ram being connected to said bearing platen;



a central powerful mold-opening rod and a predetermined number of bearing rods provided around said powerful-mold-opening rod, an end of each of both kinds of said rods being fixed to said movable platen, and the other ends of both kinds of said rods being inserted into and being adjacent to a plurality of lateral bores respectively, said lateral bores being provided in a central portion and a peripheral portion of said bearing platen;

a fastening member for engaging a front end of said powerful mold-opening rod having been inserted into said lateral bore;

a mold-opening/closing cylinder provided between said movable platen and said bearing platen; and

a control unit provided with a control plate acting also as a pressure transmitting member, said control unit provided in said bearing platen and opposite said movable platen and performing an opening/closing operation of said lateral bores opposite said bearing rod.

4,571,170

GLAZING TOOL

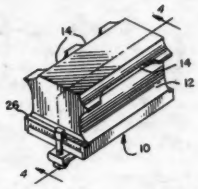
Edd Tackett, Rte. 3, Box 200-A, Huntsville, Ark. 72740, and Mary E. Broscoff, 1817 Miracerros La., Alamogordo, N. Mex. 88310

Filed Jun. 4, 1984, Ser. No. 616,664

Int. Cl.[4] B05C *17/10*

U.S. Cl. 425—458 **5 Claims**

1. A glazing tool for providing a smooth and uniform bead of putty between a window pane and window frame comprising: a block shaped body member having an upper portion suitable for engagement by the hand of a user, and a lower surface; said lower surface including a generally rectangular bottom plate; said plate having an integral planer work surface and straight sides, at least one of said straight sides in use engaging a window pane; a guidebar moveably mounted on said bottom plate, said guidebar having an elongated body with at least one straight edge for engaging a window frame; and means for connecting said guidebar to said bottom plate permitting said guidebar to be adjustably moveable across the entire length and width of said planer surface of said rectangular bottom plate; said straight edge of said guidebar and one of said straight sides of said bottom plate being parallel to each other defining a work area therebetween for capturing putty be-



tween said window pane and said window frame and smoothing said putty with said planer work surface of said bottom plate.

4,571,171

MULTIPLE INJECTION MOULDING APPARATUS

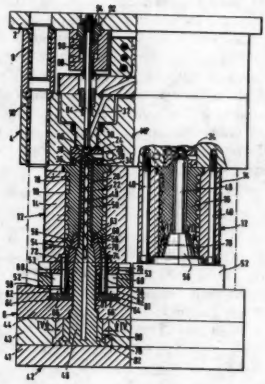
Michael G. Blank, Wuppertal, and Horst E. Hammerschmidt, Hattingen, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Koppern GmbH & Co. KG, Hattingen, Fed. Rep. of Germany

Continuation of Ser. No. 433,440, Oct. 8, 1982, abandoned. This application Apr. 5, 1984, Ser. No. 597,552

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228743

Int. Cl.[4] B29C *45/04, 45/36*

U.S. Cl. 425—533 **8 Claims**



1. A multiple injection moulding apparatus for making parisons provided with a bottle neck socket, said parisons having application for the manufacture of bottles by the blow moulding method, comprising:

a fixed plate on nozzle side of the injection moulding machine;

a plurality of outer moulds on said fixed plate, each of which defines a substantially cylindrical outer section of the parison;

a plurality of mould elements recessed into the fixed plate, said mould elements defining the mould contour which forms the base of the parison, each of said mold elements also including a filling channel;

a core-carrying plate movable within the injection moulding machine and to which there are fixed a plurality of cores respectively engageable with said outer moulds;

pairs of mould end plates movable at right angles to the axis of said outer moulds, said mould end plates having an

internal contour dimensioned for molding the socket of the bottle neck, said bottle neck including a radially-projecting stopper-engaging contour and a neck ring having a diameter greater than that of the stopper-engaging contour;

an intermediate plate on which said mould end plates are mounted and which is movable relative to said core-carrying plate and said fixed plate in order to withdraw said cores out of the parisons and the parisons out of said outer moulds;

a plurality of inner housings in each of which one of said outer moulds is formed;

a separate pair of said mould end plates being assigned to each of said outer moulds;

each pair of mould end plates having an outer frustoconical surface, said outer moulds having internal frusto-conical surfaces which are respectively cooperative with said outer frusto-conical end plate surfaces, each of said mould end plates also including an inner frusto-conical surface which is coaxial with the socket of the bottle neck to be formed on the parison, said mould end plates being cooperative, respectively, with outer frustoconical surfaces on said cores;

a plurality of separate guides, each extending at right angles to the direction in which the injection moulding apparatus opens, each pair of said mould end plates being mounted in said guides;

a common hydraulic drive for a plurality of adjacent pairs of said mould end plates to open and close the pairs of said mould end plates;

driving means operable for adjusting said intermediate plate relative to said core-carrying plate during the opening movement of the latter;

control means operable such that, during the opening movement of the injection moulding apparatus after release of said frusto-conical surfaces of said outer mould, the pairs of mould plates are moved through a first opening movement over a distance which is greater than the radial height of the stopperengaging contour but smaller than the radial height of said neck ring; and

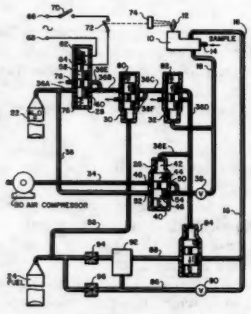
additional control means operable such that said pairs of mould end plates are moved to complete the opening movement thereof after the parison have been released form said cores.

4,571,172

SYSTEM FOR CHANGING OXIDANTS IN A FLAME ATOMIC ABSORPTION SPECTROPHOTOMETER

Michael W. Kendall-Tobias, Danbury, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Nov. 13, 1984, Ser. No. 670,713
Int. Cl.[4] G01J *3/30*
U.S. Cl. 431—62 **13 Claims**



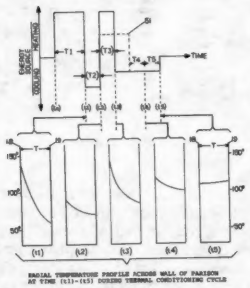
1. In a flame atomic absorption spectrophotometer burner apparatus for burning a fuel such as acetylene as one essential gas in an oxidant such as nitrous oxide as another essential gas, a system for safely changing oxidants between air and nitrous oxide during start up comprising means for sensing the pressure of at least one of said essential gasses, and means selectively operable in response to said pressure sensing means for effecting the supplying of air as the oxidant and continuing to supply air as the oxidant when the pressure of said essential gas is low and for selectively switching to nitrous oxide as the oxidant only when the essential gas pressure is high.

4,571,173

METHOD FOR THERMALLY CONDITIONING A THERMOPLASTIC PREFORM

Long F. Chang, Sylvania, and Scott W. Steele, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 378,166, May 14, 1982, abandoned.
This application Sep. 20, 1984, Ser. No. 652,244
Int. Cl.[4] F27B *9/12;* **B29C** *17/07*
U.S. Cl. 432—9 **18 Claims**



RADIAL TEMPERATURE PROFILE ACROSS WALL OF PARISON AT TIME (t1)-(t5) DURING THERMAL CONDITIONING CYCLE

1. A method for thermally conditioning a crystallizable thermoplastic preform having opposing surfaces to a desired orientation temperature at which the thermoplastic material can be biaxially stretched, comprising the steps of:

(a) heating the preform by applying heat to an exterior surface thereof as shown in the heating period **T1** in FIG. **5** until the surface reaches a maximum heating temperature less than the temperature at which the thermoplastic material begins to crystalize, the opossing interior surface not reaching the desired orientation temperature;

(b) cooling quickly in cooling period **T2** as shown in FIG. **5** the heated exterior surface to remove the heat therefrom until the temperature of the heated surface substantially equilibrates with the temperature of the opposing surface as shown in time **t2** in FIG. **5**;

(c) reheating the preform in reheating period **T3** by applying heat to the cooled surface thereof until the surface reaches a temperature no higher than the maximum heating temperature to again add heat within the preform, the opposing interior surface in **t3** being higher than in **t2** but still not reaching the desired orientation temperature;

(d) recooling the reheated surface in recooling period **T4** to again remove the heat therefrom until the temperature of the heated surface is closer to the temperature of the opposing surface near the desired orientation temperature so that the temperature of the preform becomes substantially more uniform from the reheated surface to the opposing interior surface in period **T4** than **T3**; and

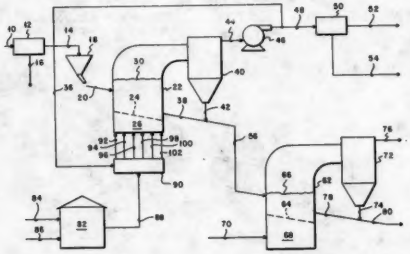
(e) further recooling in recooling period **T5** the exterior surface so that the temperature of the exterior surface substantially equilibrates with the temperature of the opposing surface at the desired orientation temperature as shown in **t5**.

4,571,174

METHOD FOR DRYING PARTICULATE LAW RANK COAL IN A FLUIDIZED BED

Walter W. Shelton, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 29, 1984, Ser. No. 594,967
Int. Cl.[4] F27B *15/00*; F26B *7/00*; C10L *5/00*
U.S. Cl. 432—14 10 Claims



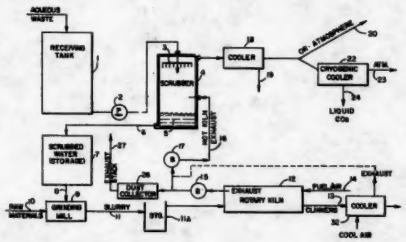
1. In a method for drying particulate low rank coal in a fluidized bed, said method consisting essentially of:
(a) charging said coal to a coal drying zone;
(b) supporting said coal above a support means in said coal drying zone, said support means being adapted to the flow of a hot fluidizing gas upwardly through said support means and said coal;
(c) flowing hot fluidizing gas through said support means and said coal to fluidize said coal and dry said coal; and,
(d) retaining said coal in said drying zone for a time sufficient to reduce the water content of said coal to a desired level; an improvement comprising: flowing fluidizing gas of varying temperatures from about 200° to about 1000° F. through at least three distribution areas beneath said support means and upwardly through said fluidized bed so that the hottest fluidizing gas flows upwardly through said coal nearest the coal inlet to said fluidized bed, fluidizing gas at an intermediate temperature flows upwardly through a middle area in said fluidized bed and the coolest fluidizing gas flows upwardly through said coal nearest the dried coal outlet from said fluidized bed said coolest gas being at a temperature less than about 300° F.

4,571,175

PROCESS FOR A DISPOSAL OF WASTE SOLUTIONS

Hugh A. Bogle, Sarasota, Fla., and Charles E. Buchanan, Nazareth, Pa., assignors to Roan Industries, Inc., Bath, Pa.

Filed Apr. 29, 1985, Ser. No. 728,284
Int. Cl.[4] F27B *15/00*; F23G *7/04*
U.S. Cl. 432—14 10 Claims



1. A method of disposing of aqueous waste having a liquid component, combustible material and pollutants which are volatile below the boiling point of the liquid component by employing said aqueous waste as the liquid component of a cement slurry in a cement kiln apparatus, said method preventing the escape of volatile pollutants into the atmosphere and preventing the buildup gaseous volatile pollutants within the cement kiln, and comprising the steps of:
a. contacting the aqueous waste with hot gaseous effluent from the cement kiln apparatus in a contact vessel to raise the temperature of the aqueous waste to a temperature below the boiling point of the liquid component sufficient to vaporize the volatile pollutants and thereby remove them from the aqueous waste to form a volatile-free waste solution;
b. collecting the volatile-free waste solution;
c. combining the volatile-free waste solution with cement raw materials, and comminuting the resulting mixture to a fine slurry;
d. burning the combustible material in said slurry in the cement kiln apparatus to generate hot gaseous effluent and forming cement clinkers from the raw materials; and
e. discharging the hot gaseous effluent from said cement kiln apparatus, and directing at least a portion of said hot gaseous effluent to the contact vessel to accomplish said step of contacting the waste solution with hot gaseous effluent.

4,571,176

BUCKET WHEEL VALVE

Gerhard Gudat, Oelde; Gotthardt Blascyk, Beckum, and Friedrich Wingenfeld, Warendorf, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

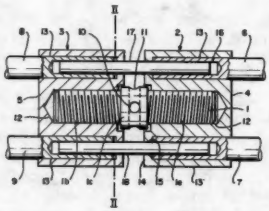
Filed May 11, 1984, Ser. No. 609,432
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320930
Int. Cl.[4] F24J *3/00*; F16K *49/00*; B67D *5/64*
U.S. Cl. 432—226 5 Claims

1. In a bucket wheel valve having a housing provided with opposite sides, a rotor rotatable about an axis and having walls defining a plurality of circumferentially spaced cells radially outward of said axis for the accommodation and rotary transport of loose material, means mounting said rotor within said housing for rotation about an axis and spaced from said sides, at least one gas flow chamber extending axially of said rotor and defined in part by said walls, an opening in each of said sides, hot gas supply means in communication with the opening in one of said sides and hot gas discharge means in communication with the opening in the other of said sides, the improvement comprising tubular means carried by said rotor at each end thereof and spanning the space between said rotor and the sides of said housing, said tubular means constituting extensions of said chamber at opposite ends of said rotor.

4,571,177
ORTHODONTIC JACK FOR MAXILLARY EXPANSION APPLIANCE

José Dahan, Kraainem, Belgium, assignor to Rodam SA, Geneve, Switzerland

Filed Feb. 4, 1985, Ser. No. 697,732
Claims priority, application Switzerland, Feb. 13, 1984, 681/84
Int. Cl.³ A61C 7/00
U.S. Cl. 433—7 5 Claims



1. An orthodontic screw-jack for a maxillary expansion appliance having anchoring means, of the type having two spaced jack bodies, connecting means disposed between said jack bodies and including sliding guide elements and a screw for adjusting the spacing between said jack bodies, each of said jack bodies including a nut and two rods fixed to said nut for connecting said nut to said anchoring means and each including a rectilinear extremity fitted in said nut along an axis parallel to the axis of said screw, wherein the improvement comprises:

two recesses situated in each said nut for respectively receiving a said rectilinear extremity of one of said rods, each of said recesses including a bottom pierced by an opening,

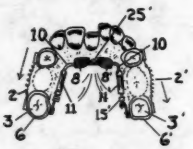
a blind hole situated in each said rectilinear extremity, and

two rectilinear pins forming part of said connecting means and each slidingly fitted at each end in a respective said opening and in a respective said blind hole.

4,571,178
FORWARD-BACKWARD MOLAR CONTROLLING AND POSITIONING DENTAL APPLIANCE

Farel A. Rosenberg, 10535 Wilshire Blvd., #1811, Los Angeles, Calif. 90024

Filed Dec. 7, 1984, Ser. No. 679,472
Int. Cl.⁴ A61C 3/00
U.S. Cl. 433—18 5 Claims



1. A dental appliance for use in particular orthodontic procedures as a tooth movement inhibitor, inducer and controller comprised in combination of:

a. a pair of separated, padded plates shaped to bear against tissue covered, relatively unyielding basal bony areas and rotatably mounted about a primary rod which is terminated at either end by an adjustable force exerting member;

b. width adjusting means between said padded plates to be used to custom fit the appliance to either dental arch;

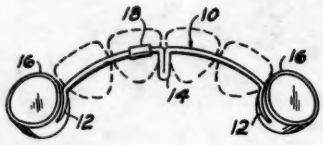
c. means for coupling said adjustable force exerting members to a pair of teeth selected for anchoring purposes at opposite, posterior ends of the dental arch;

whereby the anchorage provided between the teeth selected for anchoring purposes and the tissue covered basal bony areas is facilitated and improved by the rotatable feature of the padded plates which permits optimum contact.

4,571,179
ORTHODONTIC APPLIANCE

Jack W. Balenseifen, 7505 NW. 23, Bethany, Okla. 73008

Filed Apr. 11, 1985, Ser. No. 722,039
Int. Cl.⁴ A61C 3/00
U.S. Cl. 433—20 7 Claims



1. An orthodontic mandibular arch wire for use with orthodontic bands or bonding pads, comprising:

a unitary spring wire section substantially U-shaped in the plane of the natural dental arch and having its opposing end portions for connecting to a pair of orthodontic bands or bonding pads secured to a patient's cuspids;

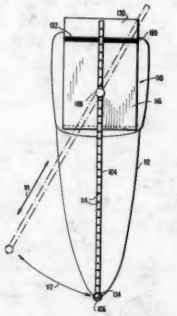
at least one transverse closed loop extending laterally and offset from the plane of said U-shaped wire so as to extend in a lingual direction and being located intermediate the ends of said wire section for permitting flexing movement in a lingual direction of intermediate portions of said wire section; and,

means interposed between said wire section and a selected tooth of a patient's mandibular dental arch for moving said selected tooth relative to the adjacent teeth by the torsional resistance of that portion of the wire section forming the closed loop.

4,571,180
DENTAL INSTRUMENT

Walter K. Kulick, 11140 NW. 26th St., Sunrise, Fla. 33322

Filed Mar. 8, 1984, Ser. No. 587,459
Int. Cl.⁴ A61C 19/04
U.S. Cl. 433—72 8 Claims



1. A dental instrument for locating the apex of a tooth in a non-invasive manner comprising:

mounting means for mounting the dental instrument to a tooth whose apex is to be located, said mounting means

including means for attaching said instrument to the external surface of a tooth in a non-invasive manner;

indicator means comprising a material that produces a visible image on a radiograph; and

coupling means for adjustably coupling the indicator means to the mounting means to permit adjustment of the indicator means relative to the mounting means;

wherein, when the dental instrument is mounted to the tooth, the indicator means is located external to the tooth and is adjustable relative to the tooth to permit substantial alignment of the images of the indicator means and tooth apex on the radiograph.

4,571,181

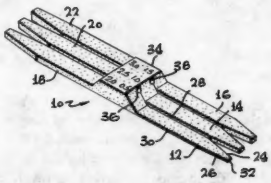
DENTAL THICKNESS GAUGE

Robert P. Berger, 4421 Rochelle Pl., Encino, Calif. 91316

Filed Dec. 26, 1984, Ser. No. 686,588

Int. Cl.[4] A61C *19/04*

U.S. Cl. 433—72 **20 Claims**



1. A dental thickness gauge comprising:

a plurality of tabs, each of said tabs being of substantially uniform thickness and each of said tabs being of a different preselected thickness, each of said tabs having a length and a width suitable for placement of a selected tab between the two cusp and fossa opposing surfaces of two opposing teeth to determine the space between the teeth, each of said tabs being made of a flexible, resilient material which is three dimensional flexible so as to flex into a concave fossa under the pressure of the pointed cusp of the opposing tooth, and so that the tab will be indented in a cusp shaped three dimensional curve when the spacing between opposing teeth is less than the thickness of the tab so that ease of withdrawal of the tab indicates adequate spacing.

4,571,182

ARRANGEMENT FOR CARRYING DENTAL IMPLEMENTS

Stefan Beier, Biberach; Franz-Xaver Boeckh, Schoneburg; Anton Braun; Thomas Brunner, both of Biberach; Dieter Hoffmann, Schemmerhofen; Peter Kiess, Mittelbiberach; Bernd Wagner, and Heiner Zinser, both of Biberach, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,827

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1983, 3302189

Int. Cl.[4] A61C *1/14*

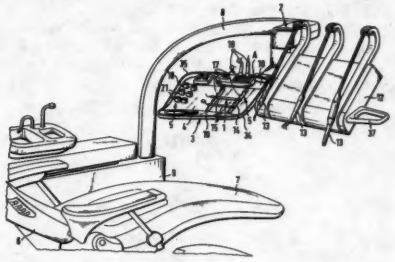
U.S. Cl. 433—79 **17 Claims**

1. In an arrangement for carrying dental implements adajacent a dental treatment chair, and including a supporting member, and a carrying plate mounted on the supporting member, and having an upwardly facing side and positioning means located on the upwardly facing side for holding the implements, the improvement comprising:

the upwardly facing side of the carrying plate is inclined relative to the horizontal and faces toward a backrest of the adjacent dental treatment chair;

the carrying plate is moveably mounted on a support arm of a dental equipment stand;

at least one extension plate an an edge of the carrying plate, arranged to extend in a horizontal position, and connected



to the carrying plate for pivotal movement relative to the carrying plate about a horizontal axis; and

wherein the carrying plate and the extension plate are restrainable in assumed positions of movement.

4,571,183

VIBRATORY ENDODONTIC DEVICE

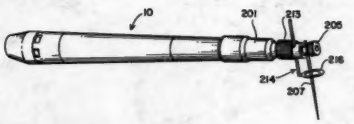
John E. Nash, Downington, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 433,075, Oct. 6, 1982, Pat. No. 4,484,891. This application Aug. 18, 1983, Ser. No. 523,833

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.[4] A61C *1/16*

U.S. Cl. 433—116 **25 Claims**



1. A vibratory device comprising:

a housing;

vibratory drive means within said housing;

means supporting said vibratory drive means within said housing, said support means substantially preventing the transfer of vibration between said vibratory drive means and said housing;

a work tool operatively connected to said vibratory drive means;

an adjustable stop means operatively connected to said housing for limiting travel of said work tool between selected positions during use of said vibratory device; and

means for substantially isolating said stop means from vibration created by said vibratory drive means;

wherein said adjustable stop means comprises a support leg and a stop arm extending from said support leg, at least a portion of said support leg being adjustably received within a slot disposed in a side wall of said housing.

4,571,184

IMPLEMENT FOR ABRASION

Svante R. Edwardson, Solna, Sweden, assignor to AB Dentatus, Hagersten, Sweden

PCT No. PCT/SE82/00277, § 371 Date Apr. 19, 1983, § 102(e) Date Apr. 19, 1983, PCT Pub. No. WO83/00824, PCT Pub. Date Mar. 17, 1983

PCT Filed Sep. 9, 1982, Ser. No. 491,966

Claims priority, application Sweden, Sep. 10, 1981, 8105396

Int. Cl.[4] A61C *3/06*

U.S. Cl. 433—166 1 Claim

1. A dental abrading implement comprising a shank means for connection to a handle means, a thin steel spatula connected to said shank means and having broad opposite sides, and on at least one of said broad sides a hard surface layer of tungsten applied to the steel with the aid of an electric arc whereby tooth enamel remains relatively unaffected during abrading.

4,571,185

RETAINING DEVICE FOR REMOVABLE DENTAL PROSTHESES

Ennio Rota, 9 Via Della Paglia, I-00153 Roma, Italy

Continuation of Ser. No. 543,459, Oct. 19, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 716,611

Claims priority, application Italy, Oct. 19, 1982, 49300 A/82

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 3 Claims

1. A method of removably attaching a dental prosthesis in a patient's mouth comprising: providing an implant having a head part and a substantially cylindrical roughened shaft part formed of relatively rigid biocompatible resin; implanting the shaft part in the patient's alveolar bone in a direction oblique or transverse to the chewing axis such that the head part is exposed; forming a cavity in an inner wall of a dental prosthesis; inserting into the cavity a mass of biocompatible resilient rubber material in the fluid state; imprinting the head part in the fluid rubber material to thereby form therein a recess which is complementary to the head; and allowing the rubber material to solidify.

4,571,186

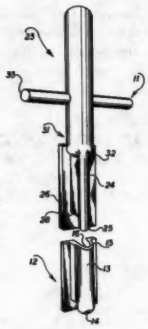
PRECISION ATTACHMENT FOR DENTURE CONSTRUCTION

Donald J. Pipko, #20H Chatham Towers, Pittsburgh, Pa. 15219

Filed Feb. 5, 1985, Ser. No. 698,326

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—181 5 Claims



1. A prosthesis construction assembly for use in placement and alignment of dental bridge components for the fabrication of human tooth replacements, comprising:

a. a rod-like female member adapted to be deposited in a cavity provided in the distal side of an anchor tooth comprising a longitudinal recess within said rod having two parallel side walls and a rounded mesial wall somewhat longer than the side walls so as to provide an end well in which a male member can pivot during the biting stresses to be imposed on the replacement teeth and wherein the recess presents an arched roof with parallel walls when viewed in a transverse section;

b. a distally outwardly oriented first flange integral with the ends of the open face of the recess and defining an external planar surface except for the recess portion;

c. a male member comprising (i) a rod portion also with a rounded first end and being sized to permit its sliding engagement and retention within the recess of said female portion; (ii) an outwardly oriented second flange portion integral with one arc of the rod portion surface and not extending beyond the point of said first rounded end, said second flange adapted to provide a sliding abutment to the external surface of said first flange; (iii) an elongated bar portion integrally attached to the other end of said male portion and abutting the proximal end of said second flange, which bar serves as an upwardly positioned mandrel during manipulation of the female member for spatial orientation thereof during fabrication; and (iv) a transverse bar disposed intermediate the ends of the mandrel portion and pinned thereto which serves to permit manipulation of the assembly to attain the desired placement of the female portion relative to the sagittal plane of the prosthesis.

4,571,187

DENTAL POST FOR RETENTION OF A PROSTHETIC SUPERSTRUCTURE

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 489,942, Apr. 29, 1983, Pat. No. 4,479,783. This application Oct. 17, 1984, Ser. No. 661,722

Int. Cl.[4] A61C *5/08*

U.S. Cl. 433—221 23 Claims

1. A dental post for retaining a dental restoration in secured position on a prepared tooth stub, said dental post comprising:

an elongated cylindrical pin having a predetermined diameter and a longitudinally extending axis;

grooves disposed about a periphery of said pin for retaining said pin secured within a cement prepared bore in the tooth stub;

a head portion extending from said pin for projecting outwardly from the tooth stub upon which the dental restoration can be secured when said pin is inserted into the tooth stub bore;

said head portion including a flattened tang member for improved retention of the dental restoration upon the tooth stub;

said tang member having a width greater than said pin diameter;

said head portion including an upwardly tapering substantially conical neck section; and

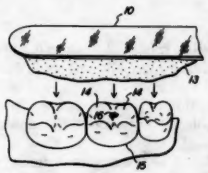
said tang member bifurcating said conical neck section for support thereby.

4,571,188

OCCLUSAL MATRIX FOR LIGHT CURED COMPOSITES

James C. Hamilton, Ann Arbor, Mich., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,676
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—226 **5 Claims**



1. A method of restoring a tooth with a light cured composite which comprises:

(a) forming a light transparent occlusal matrix which constitutes a negative reproduction of the occlusal surface of the tooth by contacting said tooth surface with a polymeric impression material which when cured is light transparent and flexible,

(b) allowing the polymeric impression material to set and stripping it away from the tooth surface,

(c) preparing a cavity preparation in the tooth surface,

(d) injecting a light cured composite into the cavity preparation,

(e) placing the previously formed occlusal matrix over said light cured composite and applying pressure to said matrix,

(f) curing said composite by exposure to photopolymerizing light which passes through said transparent matrix,

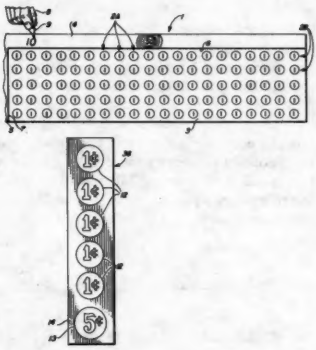
(g) followed by stripping said matrix away from the tooth surface.

4,571,189

SYSTEM FOR TEACHING COIN RELATIONSHIPS

Spencer L. Shank, 551 S. Hobson, Mesa, Ariz. 85204

Filed Apr. 26, 1985, Ser. No. 727,598
Int. Cl.[4] G09B *19/18*
U.S. Cl. 434—110 **12 Claims**



1. A system for teaching the relationships between coins of different values in a monetary system and basic change making skills comprising:

(A) a board imprinted with one hundred images of the smallest denomination coin of the monetary system disposed in an array of columns containing five coin images and rows containing twenty coin images;

(B) a first series of overlays adapted for manual emplacement and removal on said board;

(i) each overlay of a first subset of said first series including at least one column of five images of the smallest denomination coin imprinted thereon and a tab on which is imprinted the image of a single coin which represents the cumulative value of the total number of smallest denomination coin imprinted on said overlay;

(ii) each overlay of a second subset of said first series of overlays having a single image of the smallest denomination coin imprinted thereon;

(C) a second series of overlays adapted for manual emplacement and removal on said board, said second series of overlays having a background color disctinctively different from the background color of said first series of overlays;

(i) each overlay of a first subset of said second series of overlays including at least one column of five images of the smallest denomination coin imprinted thereon; and

(ii) each overlay of a second subset of said second series of overlays including one column of at least one and less than five images of the smallest denomination coin imprinted thereon.

4,571,190

DEVICE FOR FORMING BRAILLE TACTILE DISPLAY

Wolfgang Zagler, and Wolfgang Oberleitner, both of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,728
Claims priority, application Austria, Mar. 30, 1984, 1093/84
Int. Cl.[4] G09B *21/02*
U.S. Cl. 434—114 **10 Claims**

1. A device for forming a tactilely readable display including Braille characters, comprising:

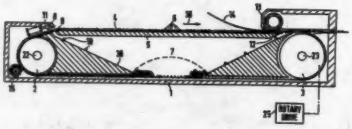
a belt of flexible material forming a closed loop having an inner side and an outer side facing oppositely thereto, said belt being provided on said outer side with a multiplicity of openings and on said inner side with a multiplicity of reces-

ses for receiving respective steel balls, said recesses each communicating with a respective one of said openings and said openings being smaller than the diameters of said steel balls so that steel balls lodged in said recesses protrude partially through the associated openings in the outer side of said closed loop to form on said outer side an array of spherical segments serving as raised raster dots in a tactilely readable display;

a pair of rolls, said belt being partially wound about each of said rolls;

frame means for supporting said rolls for rotation about respective parallel axes spaced from one another;

contact means for holding a mulitplicity of said steel balls in selected ones of said recesses in a reading zone laterally spaced from a plane defined by said axes, said contact means including a contact plate connected to said frame means and having an outer surface engageable with said belt on said inner side of an upper portion of said closed loop to thereby form said reading zone;



drive means operatively coupled to at least one of said rolls for rotating same and thereby causing said upper portion of said closed loop to move along said contact plate;

receptacle means connected to said frame means for containing a supply of said steel balls, a lower portion of said closed loop being disposed in said receptacle means, whereby each of the recesses on said inner side of the lower portion of said closed loop is filled with a respective steel ball from the supply in said receptacle means, said drive means causing said lower portion of said closed loop to move through said receptacle means upon rotation of said one of said rolls; and

selection means for retaining selected steel balls in respective recesses in said belt and for removing unselected steel balls from their respective recesses to form a tactilely readable display in said upper portion of said closed loop, said selection means being connected to said frame means and disposed at a ball selection station at an upstream end of said contact plate, as defined by the direction of motion of said belt along said contact plate upon rotation of said one of said rolls by said drive means.

4,571,191

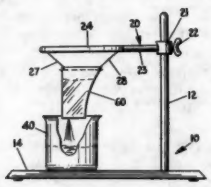
FUNNEL TEACHING METHOD AND APPARATUS

Peteris E. Graube, 1145 Collindale Ave., NW., Grand Rapids, Mich. 49504

Continuation-in-part of Ser. No. 517,973, Jul. 28, 1983, abandoned. This application Jul. 19, 1984, Ser. No. 632,617

Int. Cl.[4] G09B *23/02, 23/12*

U.S. Cl. 434—126 **41 Claims**



1. A method for teaching physical principles of fluid flow and mathematical principles of integration by concrete, measurable examples comprising the steps of:

supporting a funnel of predetermined interior configuration in position to receive liquid in an open upper end and discharge the liquid through an outlet orifice in a lower end, the funnel having sidewalls with interior surfaces that conform with mathematical formulas as a function of the distance along the funnel axis that, when inserted in the formula for calculating the time it takes for the funnel to empty, provides a function capable of being integrated;

filling the funnel with a liquid to a preselected level in the funnel; and

measuring the time it takes for all of the liquid to flow out of the funnel outlet orifice, the measured time value being comparable with a time value obtainable theoretically by integrating the equation for the theoretical time it takes the funnel to empty, a comparison of the measured and theoretical values using mathematical integration providing a concrete experience that facilitates learning the principles of fluid flow and integration in terms of abstract symbols.

4,571,192

SELF PROPELLED SPHERICAL VEHICLE

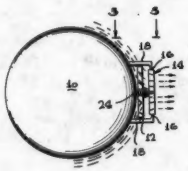
Calvin A. Gongwer, Glendora, Calif., assignor to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 550,157, Nov. 9, 1983, abandoned. This application Oct. 2, 1984, Ser. No. 657,102

The portion of the term of this patent subsequent to Mar. 29, 2000, has been disclaimed.

Int. Cl.[4] B63G *8/08*

U.S. Cl. 440—66 **11 Claims**



1. A self-propelled spherical vehicle for operation in a fluid medium comprising a generally spherical housing and an impeller external of said housing at the rear of said vehicle with respect to its direction of motion, an energy source and power means in said housing connected to cause rotation of said impeller,

said impeller being of the actuator disk type having a substantial number of radially oriented blades having a short chordal length relative to the diameter of said impeller and adjacent said housing and approximately one-half the diameter of said housing and spaced such that the maximum circle of rotation of said impeller is approximately seven percent (7%) of the diameter of said spherical housing from the surface of said housing such that it inducts a substantial part of the boundary layer at the rear of the vehicle to thereby reduce the drag on the vehicle caused by separation of the fluid over its surface,

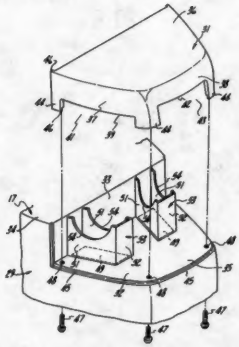
characterized in that steering means are carried at the rear of said housing comprising a stator having a substantial number of radially extending blades and having a short chordal length located immediately aft of and coaxially of said impeller, support means attached to said stator and to said housing, pivot means forming part of said support means, and

actuating means for causing said stator to turn on said pivot means, said actuating means including radially extending members located approximately at right angles to said pivot means, and control means for moving said radially extending members to pivot said stator.

4,571,193
OUTBOARD MOTOR

Yukimitsu Takada, Kosai, and Hiroshi Karada, Shizuoka, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 14, 1983, Ser. No. 485,037
Claims priority, application Japan, Apr. 24, 1982, 57-68909
Int. Cl.[4] B63H *21/24*
U.S. Cl. 440—77 17 Claims

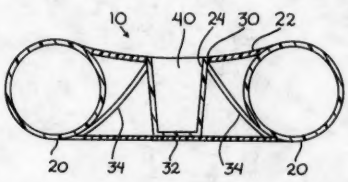


1. An air inlet system for an outboard motor or the like comprising an engine having an induction system and a protective cowling enclosing said engine and defining an air inlet cavity exending transversely across the rear portion of said protective cowling from one side to the other, air inlet means to said cavity, air outlet means from said cavity and communicating with said engine induction system, and means defining a tortuous air path between said inlet means and said outlet means for facilitating the separation of water from the air inducted into said engine, the improvement comprising said inlet means comprising at least one rearwardly facing inlet opening into said air inlet cavity and at least one sidewardly facing inlet opening into said air inlet cavity at the lower periphery thereof when said motor is in a normal running condition so that water entering said air inlet cavity may drain from said sidewardly facing inlet opening, said sidewardly facing inlet opening extending to the forward periphery of said air inlet cavity.

4,571,194
COLLAPSIBLE AND FLOATABLE BEVERAGE HOLDER

James M. Kiss, 909 Rosewood, Carpentersville, Ill. 60110, and Mathew R. P. Perrone, Jr., 306 Rustic La., Algonquin, Ill. 60102

Filed Apr. 13, 1984, Ser. No. 600,037
Int. Cl.[4] B63B *22/00*
U.S. Cl. 441—1 3 Claims



1. A flotation device for holding a beverage adjacent to a person floating in a body of water, said flotation device including an inflatable, tubular ring; a first flexible sheet secured within said ring; a second flexible sheet is secured to said ring and covers a base of said beverage support; and a beverage support centrally secured in said first flexible sheet; said flotation device further comprising:

a. a valve means being secured to said ring for inflating said flotation device;

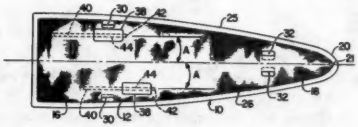
b. said beverage support being collapsible; and

c. at least two side straps running from said ring to said beverage support in order to strengthen said beverage support and said flotation device.

4,571,195
RECREATIONAL APPARATUS

William A. Brooks, Jr., Box 009, RD #3, McDonald, Pa. 15057

Filed Nov. 3, 1983, Ser. No. 548,457
Int. Cl.[4] A63C *5/04*
U.S. Cl. 441—74 16 Claims



1. In a recreational apparatus including an elongated body member adapted to carry a rider on snow or water and including steering means comprised of a pair of foot receiving depressions adapted to receive the feet of a rider in the standing position and a pair of elongated substantially identical guide runners adapted to control the path of motion of the apparatus through snow or water, the improved structure comprising:

said foot receiving depressions being spaced laterally apart and being longitudinally offset from one another and being oriented to accommodate a rider's feet only when the feet are oriented longitudinally of the apparatus, and the respective said guide runners being spaced laterally apart and being longitudinally offset from one another and positioned such that each of said foot receiving depressions overlies the respective one of said guide runners in a manner to provide a uniform positional relationship between the feet of such a rider received in said foot receiving depressions and the respective guide runners.

4,571,196
WAY TO PROLONG THE SERVICE LIFE OF PROPORTIONAL COUNTERS

Heikki J. Sipilä, Espoo, and Marja-Leena Järvinen, Helsinki, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 1, 1984, Ser. No. 575,825
Claims priority, application Finland, Feb. 2, 1983, 830353
Int. Cl.[4] H01J *9/395*
U.S. Cl. 445—53 5 Claims

1. A method for prolonging the service life of a sealed proportional counter of the type filled with a gaseous mixture of a rare gas and a hydrocarbon, comprising adding hydrogen gas to the gas mixture.

4,571,197
IMPACT RESPONSIVE TOY VEHICLE

Ralph J. Kulesza, Chicago; Harry Disko, South Barrington, both of Ill.; Stuart A. Cook, New Richmond, Ohio; Jean M. Newton, Park Hills, Ky., and William N. Smith, Batavia, Ohio, assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 29, 1985, Ser. No. 695,879
Int. Cl.[4] A63H *17/02*
U.S. Cl. 446—6 19 Claims

1. An impact responsive toy vehicle comprising:

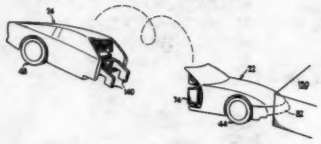
connectable separate first and second parts;

each of the first and second parts having at least one surface engaging wheel;

each of the first and second parts having a free end and a joinable end;

means carried by one of the first or second parts adjacent the joinable end for biasing the joinable end of the other of the first and second parts to separate;

means carried adjacent the joinable end of each of the first and second parts for connecting the first and second parts together into a combination supportable on the surface engaging wheels;



the connecting means including a resilient latch carried by one of the first or second parts;

a bar carried by the other of the first or second parts with the latch engaging the bar to connect the first and second parts together;

a moveable lever having an exposed end and an inner end carried by one of the first or second parts and being moveable by an impact force on the exposed end of the lever to push the inner end against the resilient latch to disengage the latch from the bar.

4,571,198

ANIMATED FIGURE HOLDER TOY

Michael W. Barbato, Hermosa Beach; Tony Rhodes, Torrance, and Edward W. Watts, Long Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 14, 1984, Ser. No. 682,021

Int. Cl.[4] A63H *3/00*

U.S. Cl. 446—73 **15 Claims**

1. In a device for enabling the holding and transporting of figure toys, the combination comprising a structure simulating the skeleton of a beast, said structure including simulated rib members connected to an elongated spinal portion, at least some of said rib members having integrally formed therewith means for releasably retaining a figure toy thereby.

4,571,199

WRIST WATCH TYPE CONTAINER FOR TOY ROBOT OR THE LIKE

Katsushi Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai, Tokyo, Japan

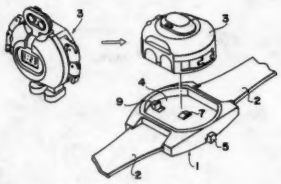
Filed Mar. 24, 1983, Ser. No. 478,452

Claims priority, application Japan, Mar. 29, 1982, 57-50673; Apr. 27, 1982, 57-70854; Jan. 19, 1983, 58-6910; Jan. 24, 1983, 58-9696

The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.

Int. Cl.[4] A63H *3/00*

U.S. Cl. 446—73 **4 Claims**



1. In combination a wrist watch type container and a toy robot including a robot body, arms, legs, and a timepiece mounted on said robot body, said arms and/or legs capable of being accommodated within or pulled out of said robot body, said toy robot for being received and held within said container, said container comprising:

a casing member comprising a hollow base portion and an edge portion extending upwardly of the peripheral margin of the hollow base portion;

engaging means mounted within said hollow base portion of said casing member;

strapping means coupled to said casing member for wearing on the wrist; and

cooperating means provided in said toy robot for coupling with said engaging means, whereby either the arms or legs of said toy robot are suitably accommodated within the space surrounded by said edge portion.

4,571,200

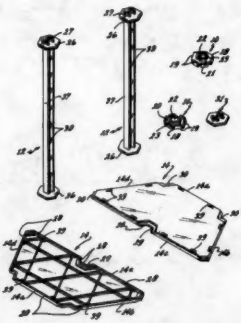
MODULAR TOY BUILDING SET

Jaime Serna, Barcelona, Spain, assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 15, 1984, Ser. No. 671,542

Int. Cl.[4] A63H *33/04*

U.S. Cl. 446—85 **7 Claims**



1. In combination, a plurality of structural members capable of being removably connected together to form a structure, the improvement comprising:

at least one polygonal shaped structural connecting member having a plurality of side edges connecting upper and lower surfaces, a central circular opening passing therethrough surrounded by an upstanding side portion on both of said surfaces, and a plurality of upstanding rib sections formed on one of said upper and lower surfaces adjacent to said side edges;

at least one elongated structural supporting member having an elongated central rod and spaced apart end caps, each of said end caps being provided with an upraised holding portion sized and shaped so as to be capable of being inserted into and snugly held in the circular central opening in said at least one structural connecting member; and

a floor member sized and shaped so as to be capable of having said structural connecting member connected thereto at predetermined locations, whereby said structural connecting member will further support said elongated structural supporting member in said central opening, with said floor member interposed between said connecting member and said support member to enable said structural members to be easily taken down or broken away.

4,571,201

TOY GUN CONVERTIBLE INTO ROBOTIC-HUMANOID FORM

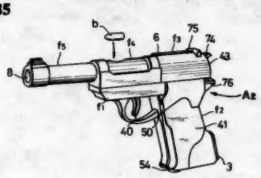
Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

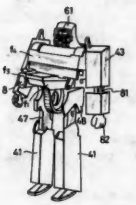
Filed Feb. 28, 1984, Ser. No. 584,531

Claims priority, application Japan, Jun. 15, 1983, 58-107553; Jun. 15, 1983, 58-91513[U]

Int. Cl.⁴ A63H *33/04, 3/46, 33/30*

U.S. Cl. 446—85 **20 Claims**





1. A combination toy gun and robotic-humanoid assembly that can be reconfigured from a gun configuration to a robot configuration at the option of the user comprising:

a handle member;

a cylinder assembly;

a gun barrel member attached to the cylinder assembly;

a trigger assembly positioned adjacent the handle member and beneath the cylinder assembly, the handle member, cylinder assembly, gun barrel member and trigger assembly being connected together for simulating the configuration of a gun in a first position, and

a robot head member movably connected to the trigger assembly, the handle member being configured to simulate the robotic legs of a humanoid robot when moved to a second position, a portion of the cylinder assembly being movable relative to the handle member and configured to simulate the robotic arms of a humanoid robot when moved to a second position, with the robotic head positioned adjacent the robotic arms and above the robotic legs wherein a toy robotic humanoid assembly can be provided in the second position by reconfiguration of the toy gun configuration.

4,571,202

ELECTRICALLY POWERED MODULAR TOY SET

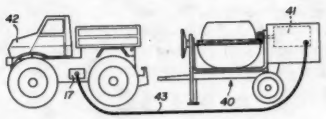
Camille Diebold, Bischoffsheim, France, assignor to Joustra S.A., France

Filed Feb. 6, 1984, Ser. No. 577,056

Claims priority, application France, Feb. 10, 1983, 83 02287

Int. Cl.⁴ A63H *33/04*

U.S. Cl. 446—90 **8 Claims**



1. A modular toy set comprising at least one miniature reproduction of a motorized vehicle chassis, and a miniature reproduction of at least one motorized accessory complementary to the said chassis, said chassis includng an electric motor having an output shaft, and having means for accommodating an electrical energy storage battery for supplying electrical energy to said motor; and an electrical outlet mounted thereon, and said accessory complementary to the said chassis including an electric motor having an output shaft, means for electrically connecting said motor of said accessory with said electrical outlet on said chassis and mechanical means for attaching said accessory to said chassis.

4,571,203

FORM-CONVERTIBLE TOY ROBOT

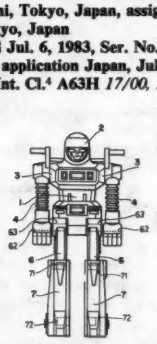
Katsushi Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai, Tokyo, Japan

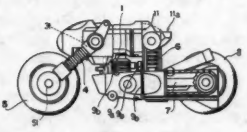
Filed Jul. 6, 1983, Ser. No. 511,158

Claims priority, application Japan, Jul. 7, 1982, 57-118125

Int. Cl.⁴ A63H *17/00, 3/46*

U.S. Cl. 446—95 **6 Claims**





1. A toy robot convertible into another form, comprising:

a body including integrally interconnected and relatively movable head, arms, shoulders, thighs and legs;

said head having a robot face on one surface thereof and a predetermined portion of said form on the other surface thereof;

said arms with shoulders being mounted rotatably on said body and being in frictional engagement with said body so that said arms and shoulders can be held at a desired angle with respect to said body;

said thighs being so mounted on said body that said thighs can take one of two positions, one position being that of a fixed relation to said body, and the other position being that of a rotatable relation to said body and in frictional engagement with said body so that said thighs can be held at a desired angle relative to said body;

said legs being mounted on said thighs for frictional movement relative to said thighs so that said legs can be held at a desired angle relative to said thighs; and

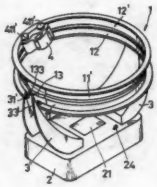
upon said arms and shoulders being rotated to take a predetermined position, said thighs being caused to take one of said positions, and said legs being moved to take a predetermined position, said toy robot being converted into said another form.

4,571,204

STUNT TOY DEVICE

Ta-Lung Wang, 1st Fl., No. 27, La. 432, Wu-hsing St., Taipei, Taiwan

Filed Feb. 10, 1984, Ser. No. 579,072
Int. Cl.[4] A63H *33/26*
U.S. Cl. 446—138 **3 Claims**



1. A stunt toy device comprising:

a ring structure having two magnetized metal rings at its inner circumference and two supports at its external circumference;

two fixing blocks beneath said supports respectively to support the ring structure;

a base beneath the fixing blocks for holding the fixing blocks on its upper surface;

a wheeled toy car with a casing which can be placed across the ring structure, said car having a top and a bottom with conductive wheels for contacting said metal rings wherein each of said wheels is installed with a magnetic element for holding the wheel in contact with said ring structure, said car having a rotating motor which receives electrical power transmitted through said wheels; and

an electric power source;

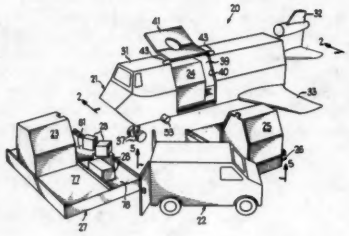
whereby when said wheeled toy car is placed on the inner circumference of said ring structure, said power source is then turned on and an electric circuit is formed including the base, said fixing blocks, said supports, said ring structure and said wheeled toy to drive said motor for rotation, said motor then drives said conductive wheels to move said wheeled toy around the inner circumference of said ring structure, said magnetic elements preventing said wheeled toy from falling down from said ring structure, the weight of said wheeled toy generating a moment of force causing said ring structure to rotate or oscillate between said supports.

4,571,205

EXPRESS DELIVERY PLAYSET

John V. Zaruba, Chicago; Burton C. Meyer, Downers Grove, and Steven P. Hanson, Winnetka, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 20, 1984, Ser. No. 572,303
Int. Cl.[4] A63H *27/00, 33/30, 17/06, 17/05*
U.S. Cl. 446—230 **17 Claims**



1. A playset comprising:

a plurality of cargo containers;

an airplane having a substantially enclosed cargo area for receiving the cargo containers;

said airplane including access means to the cargo area;

conveyor means mounted within said cargo area for transporting the cargo containers from adjacent the access means to other portions of the cargo area;

the access means including an opening into said cargo area and a hatch hingedly mounted to said airplane for closing the opening;

a first porthole in the hatch of a size for the insertion of a human digit; and

a second porthole in the airplane of a size for the insertion of a human digit into the cargo area at a location opposite the first porthole.

17. A playset comprising:

a plurality of cargo containers;

an airplane having a substantially enclosed cargo area for receiving the cargo containers;

said airplane including access means to the cargo area;

conveyor means mounted within said cargo area for transporting the cargo containers from adjacent the access means to other portions of the cargo area;

a plurality of packages;

a number of said packages being insertable within each said container;

a wheeled vehicle with a package area for receiving a number of the packages;

the wheeled vehicle having a front and a rear;

the package area being disposed toward the rear;

an opening to the package area being provided at the rear;

the package area of the wheeled vehicle having a floor mounted for tilting about a substantially horizontal axis adjacent the rear opening;

said floor including an actuator extending outwardly from the wheeled vehicle in a relationship with said horizontal axis for effecting tilting of the floor from a generally horizontal plane to a plane inclined downwardly from the front to the rear of the vehicle; and

the floor and the actuator forming a first class lever with the generally horizontal axis as the fulcrum, the actuator as the effort arm, and the floor as the load arm.

4,571,206

ACTION FIGURE WITH WING MOVEMENT DERIVED FROM LEG MOVEMENT

John F. Mayer, Fort Thomas, Ky.; Stuart A. Cook, New Richmond; Harvey G. Springer, Cincinnati, both of Ohio, and Earl M. Wood, Jr., Newport, Ky., assignors to CPG Products Corp., Minneapolis, Minn.

Filed Jan. 30, 1984, Ser. No. 574,827
Int. Cl.[4] A63H *3/20, 13/02*
U.S. Cl. 446—330 7 Claims

1. A toy action figure comprising a hollow torso including a U-shaped bottom forming parallel sidewalls and a horizontal basee, a pair of wings extending from said torso having pins mounted for pivotal movement about laterally spaced axes within said torso and rearwardly extending arms connecting said pins to said wings, a pair of legs extending from said torso mounted for rocking movement relative to the lower portion of said torso, and a pair of actuating mechanisms connecting said legs to said pins so as to convert the rocking movement of said legs to pivotal movement via said pins, each of said actuating mechanisms including an arm extending forwardly from each of said pins and a substantially vertical transmission link within said torso engaged with the forward end of each forwardly extending arm, the lower ends of said links bearing against said horizontal base, respective means securing the lower end portion of each of said links to one of said legs so that when said legs are rocked the rocking action is converted to pivotal movement of the forwardly extending arms, the outwardly facing side portions of said links engaging the inner surfaces of said sidewalls when said legs are rocked sufficiently toward each other, whereby said wings are caused to pivot relative to said torso in a flapping manner.

4,571,207

EXERCISE TOY FOR DOLL

Richard E. Henderson, Costa Mesa, and Mark S. Wittenberg, Anaheim, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 3, 1985, Ser. No. 688,665
Int. Cl.[4] A63H *11/00, 3/00*
U.S. Cl. 446—352 12 Claims

1. In a toy exercise apparatus, the combination comprising:

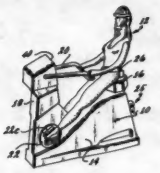
(a) a housing having formed thereon a surface simulating a control panel with window means therein and seat means for retaining a figure toy thereon;

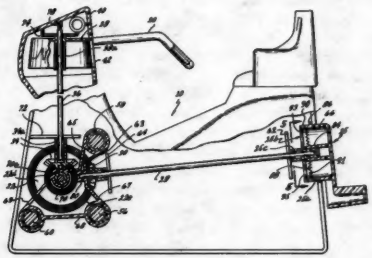
(b) pedal means rotatably mounted to said housing and having means for retaining the feet of the figure toy;

(c) manually rotatable crank means on said housing;

(d) indicia means movably mounted within said housing for viewing through said window means; and

(e) means within said housing responsive to rotation of said crank means for (i) rotating said pedal means and (ii) moving said indicia means for positioning different portions thereof for viewing through said window means, whereby rotation of said crank means moves the legs of the figure toy to simulate bicycling with the movement of





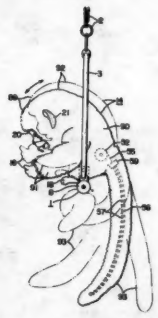
said indicia means simulating display of a function related to the exercise.

4,571,208

TOY WITH SWING

Hiroshi Saigo, Kasukabe, and Kazuo Nagamori, Tokyo, both of Japan, assignors to Iwaya Corporation, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,881
Claims priority, application Japan, Aug. 25, 1983, 58-155546
Int. Cl.[4] A63H *11/00*
U.S. Cl. 446—353 1 Claim



1. A toy that simulates a monkey swinging on a swing, comprising a suspension member, a perch member which is supported by said suspension member and which houses at least one battery cell, a toy monkey member having a tail which normally extends downward and which has an upper end and a lower tip end, said toy monkey member being mounted on said perch member and housing a driving mechanism electrically connectable to said cell and a swinging mechanism which is driven by said driving mechanism and whereby the perch member and the toy monkey member are caused to move alternately forward and backward, said toy being characterized by means for causing said tail to alternately curl up

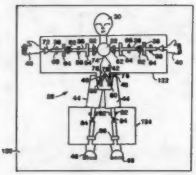
and extend when said driving mechanism is operating, comprising: an elongated tail frame within said tail that is resiliently flexible lengthwise, said tail frame having guide eyes at one lateral side thereof spaced at intervals along its length; a cord extending through said guide eyes and having one end secured to the tip end of the tail frame so that taking up the other end of the cord causes the tail frame to curl; a winding wheel adjacent to the upper end of the tail frame and to which said other end of the cord is eccentrically connected, said winding wheel being rotatable in a winding direction to take up the cord and being rotatable in the opposite direction by unwinding of the cord under uncurling bias of the tail frame; a driven gear concentric with said winding wheel and constrained to rotate therewith; a sector gear swingable about a sector gear axis and having gear teeth concentric to that axis which mesh with the teeth of the driven gear so that swinging of the sector gear in one direction imparts rotation in said winding direction to the winding wheel and rotation of the winding wheel in said opposite direction swings the sector gear in its opposite direction, said sector gear also having a cam follower surface extending substantially radially in relation to said axis; and a cam disc driven by said driving mechanism for unidirectional rotation about a cam disc axis which is in fixed spaced relation to said sector gear axis, said cam disc having thereon at least one substantially radially extending camming surface which engages said cam follower surface during one part of each revolution of the cam disc to swing said sector gear in said one direction, said cam disc being disengaged from said second gear during another part of the cam disc revolution to permit the winding wheel and the sector gear to move in their said opposite directions.

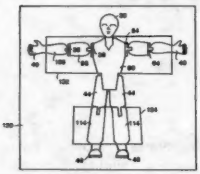
4,571,209

ARTICULATED TOY FIGURE

Peter R. Manning, Wathen Cottage, Lower Meend, Briavels, Glouchestershire, and A. John Dixon, Hooks Farm, Woods Corner, Dallington, Sussex, both of United Kingdom

Filed May 6, 1983, Ser. No. 492,442
Int. Cl.[4] A63H *3/46*
U.S. Cl. 446—375 **22 Claims**





1. An articulated toy figure, comprising:

(a) a first relatively rigid injection molded plastic element and at least one second relatively rigid injection molded plastic element,

wherein the first element is connected to the at least one second element by a breakable portion and broken apart therefrom,

wherein the at least one second element is positioned adjacent the first element, and

wherein the at least one second element has integrally molded joint means; and

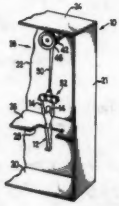
(b) a third relatively rigid injection molded plastic element having a first portion thereof injection molded around part of the first element and a second portion thereof injection molded around part of the at least one second element to movably join the first element and the at least one second element together.

4,571,210

TOY PLAYSET ELEVATOR

John V. Zaruba; Michael A. Andersen, both of Chicago, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 7, 1985, Ser. No. 699,070
Int. Cl.[4] A63H *33/30, 11/04*
U.S. Cl. 446—424 **10 Claims**



1. A toy playset elevator comprising:

a playset wall supportable on a surface and having a predetermined height;

a rotatable drum carried by the wall at a fixed height above the surface;

a length of cable attached to the drum for winding and unwinding about the drum;

a carrier for a toy figure attached to the length of cable so that the carrier is transported as the cable is wound and unwound about the drum;

the carrier including an elongated, open bottomed shell;

a foam material having opposed faces inserted into the shell forming a slit along the length of the open bottom; and

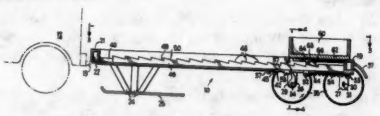
the foam material being sufficiently resilient and having a high enough density such that the hands of a toy figure may be inserted into and retained by the slit so that the figure may be transported by winding and unwinding the drum.

4,571,211

TOY PULL ACCESSORY FOR SELF-PROPELLED TOY VEHICLE

Wayne A. Kuna, Oak Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 8, 1984, Ser. No. 578,195
Int. Cl.[4] A63H *17/26*
U.S. Cl. 446—448 **16 Claims**



1. A toy pull-sled accessory for a self-propelled toy vehicle comprising:

an elongated frame having a rear end and a front end;

a weight supported for movement along the elongated frame;

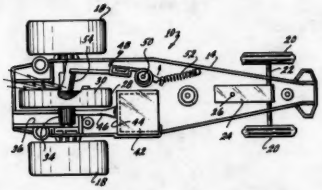
a pair of surface engaging wheels mounted on an axle for rotation with the axle;
means connecting the axle to the frame adjacent the rear end for rotation relative to the frame;
a friction pad depending from adjacent the front end of the frame and adapted to engage the same surface as the wheels;
an elongated gear extending beneath the weight intermediate the ends of the frame;
means on the weight engaging the elongated gear;
a drive gear mounted on the axle for rotation with the axle and in at least periodic engagement with the elongated gear to drive the elongated gear; and linear movement of the weight along the frame from adjacent the rear end to adjacent the front end of the frame being effected solely by the engagement between the means on the weight and the driven elongated gear.

4,571,212

SPARK EMITTING FLY WHEEL DRIVEN VEHICLE

Katsumi Kakizaki, Tokyo, Japan, assignor to Tomy Company, Incorporated, Japan

Filed May 14, 1984, Ser. No. 609,983
Int. Cl.[4] A63H *29/02*
U.S. Cl. 446—462 **4 Claims**



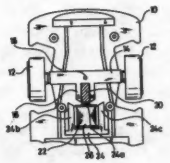
1. A toy vehicle which comprises:
a chassis having a first end and a second end;
at least one wheel rotatably mounted proximal to said first end of said chassis for rollably supporting said first end of said chassis;
a flywheel mounted about a flywheel axle proximal to said second end of said chassis, said flywheel at least partially supporting said second end of said chassis;
a pinion gear rotatably mounted about said axle and operatively connected to said flywheel such that rotation of said pinion gear rotates said flywheel;
a guide channel located on said chassis in association with said pinion gear, said guide channel for receiving a gear rack member and locating said gear rack member in mesh with said pinion gear whereby said flywheel can be energized by rotation of said flywheel by said pinion gear by movement of said gear rack within said guide channel to rotate said pinion gear;
a material located in a pattern around one side of said flywheel, said material capable of interacting with a flint so as to produce sparks;
a flint holding member axle located on said chassis;
a flint holding member pivotally mounted to said chassis by said flint holding member axle, the axis of rotation of said flint holding member about said flint holding member axle being orthogonal with respect to the axis of rotation of said flywheel about said flywheel axle;
a flint positioned on said flint holding member in a location so as to contact said material on said flywheel;
a biasing means associated with said flint holding member, said biasing means biasing said flint holding member in a direction so as to bias said flint against said material on said flywheel whereby, as said flywheel rotates, said flint is in contact with said flywheel and produces sparks in conjunction with said rotation of said flywheel;
a sound means located on said chassis in operative association with said pinion, said sound means includes a resonator chamber and a pick up member, said pick up member attaching to said resonator chamber and projecting from said resonator chamber toward said pinion so as to contact said pinion, said pinion vibrating said pick up member in response to rotation of said pinion.

4,571,213

DIRECTION-CONVERTING DEVICE FOR A TOY CAR

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,960
Claims priority, application Japan, Nov. 17, 1983, 58-176734[U]; Nov. 17, 1983, 58-176735[U]
Int. Cl.[4] A63H *17/36*
U.S. Cl. 446—468 **8 Claims**



1. A direction-converting device having a neutral position-restoring and position-retaining function for a toy car having a horizontal base, which comprises an electromagnet means having an excitable iron core with its opposite sides being energizable to different polarities directed to the same direction, and a permanent magnet means having opposite end faces with different polarities, said electromagnet means being disposed oppositely to said magnet means on said car base, one core portion of said electromagnet means at its free end having a width equal to or larger than the width of the opposed end of said permanent magnet means, one of said magnet means being fixed to one end of a controlling element arranged at a mid portion of a steering element swingably secured to the car base, the other magnet means being fixed to the car base, said electromagnet means and said permanent magnet means being arranged so that the neutral position of said steering element may be restored and retained through an attractive relation between said permanent magnet means and said one core portion of the electromagnet means upon deenergization of the latter.

4,571,214

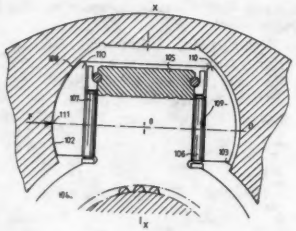
TRANSMISSION JOINT, IN PARTICULAR FOR A MOTOR VEHICLE

Michel A. Orain, Conflans Ste Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Jul. 31, 1984, Ser. No. 636,250
Claims priority, application France, Aug. 2, 1983, 83 12724
Int. Cl.[4] F16D *3/22*
U.S. Cl. 464—111 **5 Claims**

1. A transmission joint comprising a first element having a first axis of rotation and defining at least one radial trunnion having a second axis of rotation extending radially from said first axis, a roller having a spherical outer contour and provided with a bore, needles interposed between the bore and the trunnion for rotatively mounting the roller on the trunnion, and a second element defining at least two rolling tracks for the roller, said two rolling tracks having, in section in a first plane

perpendicular to their means line, a substantially circular shape constituted by two arcs of a circle having a radius slightly larger than the radius of the spherical surface of the roller, the roller being unsymmetrical relative to a second plane which contains a centre of said spherical contour and is perpendicular to said second axis and the roller having a sectional shape in a radial plane containing said first axis defined by said bore and



said spherical contour which tapers substantially to a point from said second plane radially outwardly of said first axis, the roller having a greater axial extent outwardly of said second plane than inwardly of said second plane, said two rolling tracks extending at least to an outer end of the roller under all operating conditions of the transmission joint and said needles being substantially symmetrically disposed relative to said second plane.

4,571,215

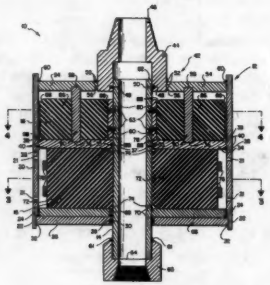
VIBRATION DAMPENER APPARATUS

Michael S. Hansen, West Valley City, Utah, assignor to Boroloy Industries International, Inc., Post Falls, Id.

Filed Jun. 8, 1983, Ser. No. 502,127

Int. Cl.[4] E21B *7/22, 17/02, 17/18*

U.S. Cl. 464—180 **15 Claims**



1. An apparatus for dampening axial and torsional vibration along an axis, comprising:

a first rotational member having a central axis;

a second rotational member coaxially mounted to said first rotational member for axial and rotational motion relative to said first rotational member along said axis;

said first rotational member including a first rigid radial element having first and second opposed sides;

said second rotational member including a second rigid radial element having one side facing and spaced axially from said first side of the first radial element;

first resilient means located between said first and second rotational members and axially engaged between said first side of the first radial element and said one side of the second radial element for absorbing only axial vibrations transferred from one rotational member to the other along said axis;

said second rotational member further including a first rigid axial element located axially adjacent said second side of the first radial element and having sides angularly spaced about said axis;

said first rotational member further including a second rigid axial element located axially adjacent said second side of the first radial element and between said sides of the first axial element; and

second resilient means located between said first and second rotational members and radially engaged between said first and second axial members for absorbing only torsional vibrations transferred from one rotational member to the other about said axis.

4,571,216

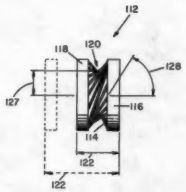
VARIABLE SPEED BELT DRIVEN TRANSMISSION SYSTEM AND METHOD

Richard F. Stieg, Boulder; John P. Dolan, Littleton; Wm. Spencer Worley, Aurora, all of Colo., and Goran Gerbert, Staffanstorp, Sweden, assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 335,981, Dec. 30, 1981, Pat. No. 4,534,748. This application May 31, 1985, Ser. No. 739,739

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—8 **1 Claim**



1. An actuator for use in moving a pulley half of a variable speed pulley, the actuator comprising:

a plurality of circumferentially spaced and similarly arranged flexible cord links, each substantially lacking in spring rate and having first and second end portions radially spaced from an axis;

a first means coaxial with the axis for attaching the first end portions of the links;

an axially spaced, second means coaxial with the axis for attaching the second end portions of the links, the first attachment means and cord links positioned so that a rotation of one attachment means, relative to the axis, shortens the axial space between the first and second attaching means and wherein the first end portions of the cord links are pre-rotated along a circumference about the axis from about 30 to about 70 degrees in relation to the second end portions.

4,571,217

VARIABLE PULLEY STRUCTURE

Hiroshi Takano, Miki, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan

Continuation of Ser. No. 318,357, Nov. 5, 1981, abandoned. This application Feb. 26, 1985, Ser. No. 705,851

Claims priority, application Japan, Nov. 5, 1980, 55-156117; Jan. 17, 1981, 56-4789

Int. Cl.[4] F16H *55/56, 57/04;* F16F *1/14*

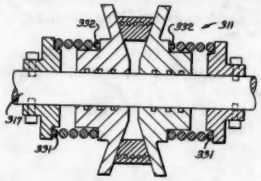
U.S. Cl. 474—46 **14 Claims**

14. Means for resiliently urging toward each other coaxial halves of a variable pulley, comprising:

a first shoulder on one half of the pulley facing in a first circumferential direction about the axis of the pulley half from a radial plane defined by said axis;

a second shoulder on the other half of the pulley facing in the opposite circumferential direction from a radial plane defined by said axis; and

a coil spring extending coaxially between said pulley halves



and having one end endwise abutting said first shoulder and an opposite end endwise abutting said second shoulder to have free radial expansion radially of said axis as an incident of an increase in torque between the pulley halves.

4,571,218

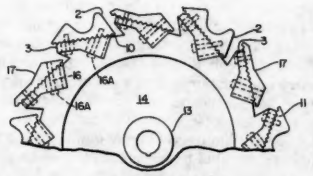
ADJUSTABLE PITCH SPROCKET

James B. Reeves, Jr., 1315 Whitman Dr., Glen Burnie, Md. 21061

Continuation-in-part of Ser. No. 512,540, Jul. 11, 1983, Pat. No. 4,531,926, and Ser. No. 611,111, May 17, 1984. This application Sep. 5, 1984, Ser. No. 647,437

Int. Cl.[4] F16H *9/02*

U.S. Cl. 474—49 **19 Claims**



1. An adjustable sprocket, to be used in a chain drive, to compensate for chain and tooth wear by selective adjustment to move portions of the sprocket radially outward, comprising:

a plurality of separate individual sprocket teeth, each of said teeth having a first surface containing a first plurality of discrete graduations disposed with even spacing in a fixed configuration along one linear dimension of said first surface;

an adaptor disc having means for connecting the disc for rotation about a sprocket axis;

said adaptor disc including means on the periphery of said disc having a plurality of second surfaces for mounting each of said teeth on said adaptor disc to be fixed in the rotational direction of said disc, said second surfaces each having a second plurality of discrete graduations exhibiting said even spacing of said fixed configuration with said second plurality of graduations being aligned along lines transversing radial projections extending from said sprocket axis; and

means for selectively locking said teeth fixedly to said mounting means on said disc in an adjusted position with said first plurality of graduations engaging said second plurality of graduations, to produce a rigid sprocket assembly, and unlocking said teeth selectively to permit radial adjustment motion between said teeth and said sprocket axis.

4,571,219

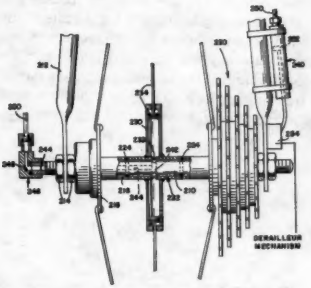
BICYCLE TRANSMISSION

Charles R. Breden, Westmont, and Zygmunt Danielczyk, Chicago, both of Ill., assignors to Daniel Corporation, Westmont, Ill.

Continuation-in-part of Ser. No. 187,083, Sep. 15, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 357,842

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—70 **5 Claims**



1. An automatic transmission system for a chain drive vehicle comprising a frame having a crank and a crank-driven sprocket supported thereon; said frame having a fixed drive axle with a drive wheel supported on said axle, a multi-speed sprocket assembly having a plurality of sprockets rotatable on said drive axle and operatively connected to said drive wheel, a continuous drive chain engaging said crank-driven sprocket and engageable with each of said sprocket of said sprockets assembly to drive said drive wheel at different speeds dependent upon which of said sprockets is engaged, a derailleur mechanism supported on said frame for shifting said drive chain and actuating means for said derailleur mechanism, said actuating means including a sleeve surrounding said drive axle and defining a sealed chamber therebetween, a master cylinder communicating with said sealed chamber and connected to said derailleur mechanism with encapsulated fluid in said sealed chamber and said master cylinder, and actuating means on said drive wheel for shifting said encapsulated fluid as a function of changes in speed of said drive wheel.

4,571,220

WRAPPING TRANSMISSION

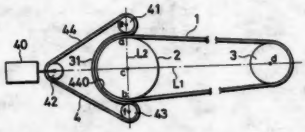
Takao Nakano, Takaishi, and Shigemitsu Tochimori, Shiki, both of Japan, assignors to Nitta Beluto Kabushikikaisha, Osaka, Japan

Filed May 11, 1982, Ser. No. 377,184

Claims priority, application Japan, Dec. 21, 1981, 56-207307

Int. Cl.[4] F16H *7/18*; F16G *1/04*

U.S. Cl. 474—100 **10 Claims**



1. A wrapping transmission, comprising:

a flat transmission belt;

a pair of pulleys including a driving pulley and a driven pulley, which engage the flat transmission belt; and

a means for pressing the flat transmission belt to the driving pulley at a portion of the transmission belt which comes

into contact with the driving pulley, said pressing means having a plurality of guide pulleys, a flat wrapping belt which operably engages the guide pulleys such that a part of the flat wrapping belt contacts and presses the back of the flat transmission belt over the entire portion of the transmission belt which comes into contact with the driving pulley, and an adjusting means, connected to one of the guide pulleys, for adjusting a pressing force generated by the pressing of the flat wrapping belt to the flat transmission belt, thereby adjusting the pressing force of the flat transmission belt to the driving pulley, said flat wrapping belt being a woven cloth, which contains natural fibers constituting the warp and synthetic fibers constituting the woof on at least its surface in engagement with the flat transmission belt, and in which the natural fibers are exposed to a greater extent than the synthetic fibers.

4,571,221
V-BELT STRETCHING MECHANISM

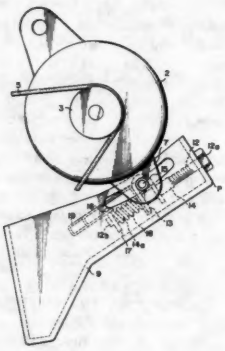
Masahiro Isobe, and Masashi Sugiura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1984, Ser. No. 683,509

Claims priority, application Japan, Jul. 21, 1983, 58-112243; Aug. 24, 1983, 58-129756

Int. Cl.[4] F16H *7/08*

U.S. Cl. 474—101 **11 Claims**



1. A V-belt stretching mechanism to adjust the tension of a V-belt wound around pulleys, the position of one of said pulleys being adjustable by moving a stay, comprising:

an adjust bar;

a slider fastened together with said stay to said adjust bar;

an adjust bolt whose head contact-engages said adjust bar and whose threaded part extends through said slider;

a nut slidably extending through said slider in the longitudinal direction of said adjust bolt and threaded onto said adjust bolt;

an extension of said nut extending away from said head of said adjust bolt;

a slide cam formed at the end of said extension;

a spring interposed between said slider and said slide cam and urging said nut toward said head of said adjust bolt; and

a spring plate extending from said slider parallel to the axis of said extension and being slidably engagable with said slide cam.

4,571,222
TENSION ROLLER FOR BELT DRIVE

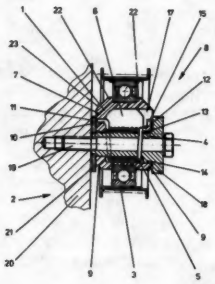
Manfred Brandenstein, Eussenheim; Roland Haas, Lendershausen; Rüdiger Hans, Niederwerrn, and Wolfgang Friedrich, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,161

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214231

Int. Cl.[4] F16H *7/10*

U.S. Cl. 474—112 **10 Claims**



1. In a tension roller for a belt drive, comprising a one-piece injection molded supporting member, the supporting member having a cylindrical interior space axially limited by first and second side walls and radially limited by a bore surface, said first and second side walls having aligned eccentrically disposed bores formed therethrough, the supporting member being eccentrically pivoted on a pivot stud extending through said bores against the force of a tension spring, said tension spring having a first portion held to said second side wall, and a roller sleeve rotatably disposed on the supporting member by way of a bearing; the improvement wherein the first side wall has a recess with first and second circumferentially spaced radially extending stopping faces, said tension spring extending into said recess for limiting swinging motion of the roller with respect to the pivot stud by engagement of said stopping faces with the tension spring, said recess extending from the respective eccentrically disposed bore radially to the bore surface of said cylindrical interior space.

4,571,223
AUTOMATIC BELT TENSIONER

Edward W. Molloy, Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1984, Ser. No. 621,151

Int. Cl.[4] F16H *7/12*

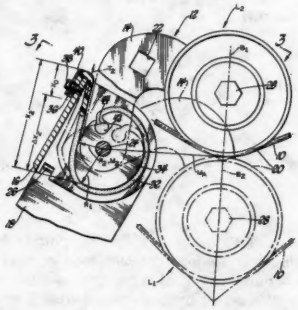
U.S. Cl. 474—133 **3 Claims**

1. In an automatic belt tensioning device of the type having a belt engaging pulley on an arm pivoted to a fixed body to rotate about an axis between first and second limit positions determined respectively by the longest and shortest expected normal life length of a belt engaged by the pulley, an improved tensioning means acting between the fixed body and the arm to produce that torque on the arm about its pivot axis that will maintain a substantially constant tension on the belt throughout its normal life as the arm moves between the limit positions, comprising:

a cam rigid with respect to the arm and rotatable therewith and having a cam surface defined about said arm pivot axis with an eccentric portion having a radius varying continuously relative to said axis between a longer first radius and a shorter second radius,

and a resilient strap having a first end joined to the fixed body and a second end affixed with respect to said cam

outside its eccentric portion, the strap being stretched within its elastic limit to cause a continuously increasing tension on the strap as the arm swings from its first to second limit position, the rotating of the arm causing the strap to wrap the eccentric portion of the cam surface in a manner to move the point of tangency of the strap continuously from the first radius to the second radius to thereby create a varying effective moment arm of the strap tension relative to the pivot axis,



whereby the torque induced by strap tension on the cam and arm at each point of the rotation may be controlled by predetermining the tangency point radius to give the necessary effective moment arm for each value of the strap tension so that the product thereof will give the torque necessary about the pivot axis on the cam and arm to thereby maintain the belt under a substantially constant tension.

4,571,224

BELT DRIVE SYSTEM

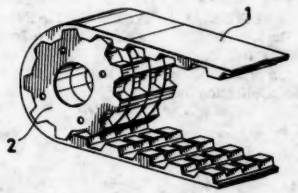
Kuniomi Arinaga, Nara, Japan, assignor to Unitta Co., Ltd., Osaka, Japan

Filed Jul. 26, 1983, Ser. No. 517,257

Claims priority, application Japan, Jul. 27, 1982, 57-131698; Mar. 9, 1983, 58-034672

Int. Cl.⁴ F16H *7/02*

U.S. Cl. 474—153 **9 Claims**



1. A belt drive system comprising a toothed belt having a body and a plurality of equally spaced teeth on the surface of the belt body which includes tensile members therein, said belt teeth having one or more grooves in the longitudinal direction of the belt; and toothed pulleys having a body and a plurality of equally spaced teeth, which engage with the belt teeth, and one or more ribs on the surface of the pulley body of each pulley which engage with the grooves in the belt teeth, and extend across the cavities between adjacent teeth of the pulley, said ribs having a radial height not greater than the height of said pulley teeth.

4,571,225

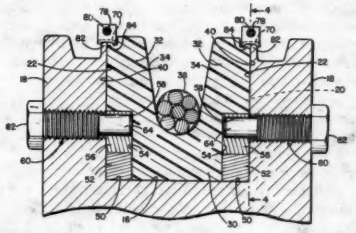
SHEAVE ASSEMBLY

William G. Lengenfelder, Jr., and Paul E. Barbie, both of Bismarck, N. Dak., assignors to Modern Machine Works Inc., Bismarck, N. Dak.

Filed Oct. 31, 1984, Ser. No. 666,974

Int. Cl.⁴ F16H *55/36, 55/48*

U.S. Cl. 474—176 **20 Claims**



1. A sheave assembly for use with a line such as a cable, comprising:

a sheave including a hub adapted to be rotatably mounted about an axis, an annular rim coaxially supported by the hub, and annular sheave side flange walls adjacent the rim, having inner facing surfaces defining an annular sheave groove therebetween;

a plurality of arcuate inserts mounted within the sheave groove in end to end relation around the rim, having outer side wall surfaces disposed in adjoining relation with the inner wall surfaces of the sheave side flange walls, and said arcuate inserts having a center groove formed therein upon which a line is supported; and

a separate detachable perimeter band extending around the outer edges of each of the sheave side flange walls and adjacent portions of the inserts for detachably securing the inserts within the sheave groove.

4,571,226

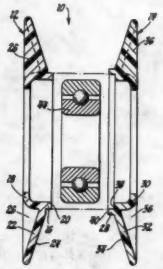
MOLDABLE PLASTIC PULLEY

Edward W. Molloy, and Raymond L. Richard, Jr., both of Port Clinton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 27, 1984, Ser. No. 584,001

Int. Cl.⁴ F16H *55/48*

U.S. Cl. 474—190 **1 Claim**



1. A belt engaging pulley wheel formed of two moldable pieces, comprising, in combination,

a first sheave having an axial hub including a stepped portion on the axially inner end thereof and a generally radially outwardly extending web integral with said hub, the axi-

ally inwardly facing side of the web and a surface of the stepped portion comprising together a continuous surface any radial cross section of which does not have a return bend relative to the axis of the hub,

the first sheave further including at least one generally planar, axially disposed rib joining the axially outwardly facing side of the web to the hub whereby the first sheave is moldable by a pair of mold elements that part between the two sides of the web,

and a second sheave having an axial hub with a stepped portion on the axially inner end thereof complementary to the stepped portion of the first sheave and having a surface sufficiently closely engageable with the surface of the first sheave axially stepped portion to allow friction welding of the two when spun oppositely,

said second sheave further including a generally radially outwardly extending web integral with said hub, the axially inwardly facing side of the web and a surface of the stepped portion comprising together a continuous surface any radial cross section of which does not have a return bend relative to the axis of the hub,

the second sheave also including at least one generally planar, axially disposed rib joining the axially outwardly facing side of the web to its hub, whereby the second sheave is moldable by a pair of mold elements which part between the two sides of the web,

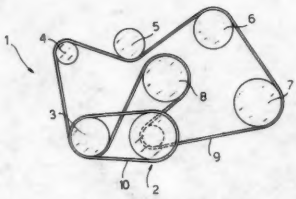
the complementary stepped portions on said first and second sheaves being sufficiently smoothly interrelated with each other so that one does not encumber the other when spun oppositely to thereby allow the two separately molded sheaves to be friction welded together thereat to form a pulley wheel by a rotary power source engageable with the ribs of the sheaves to so spin the sheaves oppositely, the hubs cooperating to form a single hub of the wheel and the two axially inwardly facing surfaces of the web cooperating to form a belt engaging groove.

4,571,227

BELT DRIVE UNIT FOR TRANSMITTING DRIVE BETWEEN THE DRIVE SHAFT ON AN INTERNAL COMBUSTION ENGINE AND ASSOCIATED ACCESSORIES

Franco Colanzi, Turin, Italy, and Gordon Beton, Birmingham, Mich., assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Jan. 31, 1985, Ser. No. 696,759
Claims priority, application Italy, Feb. 1, 1984, 52936/84[U]
Int. Cl.⁴ F16H *55/36*
U.S. Cl. 474—199 **4 Claims**



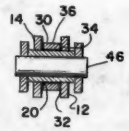
1. Belt drive unit for transmitting drive between the drive shaft on an engine and associated accessories, the said unit essentially comprising a pin, designed to fit on to one end of the said shaft, and a pair of pulleys having different diameters and turning round the said pin, a first smaller-diameter pulley being mounted on the said pin with a free-turning wheel inbetween, and the second pulley being mounted on the said pin with an electromagnetic coupling inbetween, characterised by the fact that the said pulley is provided with a first tubular element formed in one piece with the pulley itself and having a pair of races for two rings of ball bearings and a seat for the said free-turning wheel, provision being made for two rings of ball bearings designed to sustain rotation of the said tubular element in relation to the said pin.

4,571,228

BICYCLE CHAIN STRUCTURE

Wayne R. Tracy, Chickopee, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 560,407, Dec. 12, 1983, abandoned.
This application Jun. 26, 1985, Ser. No. 748,936
Int. Cl.⁴ F16G *13/02*
U.S. Cl. 474—231 **4 Claims**



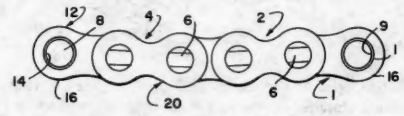
1. Bicycle chain apparatus comprising plural bushing links, each bushing link having first and second parallel bushing plates, each bushing plate having first and second bushing receiving openings near opposite ends thereof, first and second bushings press fitted in interference fit in the openings in the first plate, first and second rollers loosely positioned respectively on the first and second bushings and the first and second bushings being press fitted through the first and second openings of the second bushing plate, opposite end of the bushings extending substantially beyond the first and second bushing plates and forming thereby spacers, and plural pin links alternately connected to the plural bushing links, each pin link having first and second parallel pin plates, each pin plate having first and second pin receiving openings near opposite ends thereof, first and second pins inserted through first and second pin receiving openings in the first pin plate and respectively through a second bushing of a first bushing link and through a first bushing of a second bushing link and then respectively through first and second pin receiving openings in the second pin plate, opposite ends of the first and second pins being upset and expanded into respective first and second pin receiving openings in the pin plates, wherein the end faces of the bushings and the inner faces of the pin plates are assembled in close proximity to each other without forming a tight joint.

4,571,229

LARGE BEARING AREA POWER TRANSMISSION AND MATERIAL HANDLING CHAIN

Robert G. Burk, S. Hadley, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 560,442, Dec. 12, 1983, abandoned.
This application Jun. 3, 1985, Ser. No. 740,164
Int. Cl.⁴ F16G *13/02*
U.S. Cl. 474—231 **8 Claims**



1. Chain apparatus comprising a chain having plural spaced bushing links and plural spaced pin links respectively connecting the bushing links in spaced alternating relationships of bushing link, pin link, bushing link and pin link, each bushing link having first and second spaced opposite bushing plates and each plate having first and second bushing receiving openings, and each bushing link having first and second parallel cylindri-

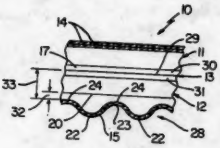
cal bushings extending into the first and second openings in the opposite bushing plates, ends of the bushings being secured in the openings for holding each bushing link in assembled condition, and each pin link comprising first and second spaced opposite pin plates positioned outward of end portions of bushing plates on adjacent bushing links, each pin plate having first and second pin receiving openings and first and second pins extending respectively through first and second openings in one pin plate and through second and first bushings respectively in adjacent bushing links and through first and second openings in the second pin plate, the pins fitting within the bushings for free rotary bearing motion between the pins and bushings and ends of the pins being fixed in the pin plates for rigidly connecting elements of the pin links and permitting the pin links and bushing links to rotate about each other on the pins and bushings, the pin plates and bushing plates having rounded ends which facilitate relative rotation of the links, wherein the bushing plates have bushing receiving openings having radii greater than one-half of corresponding radii of bushing plate ends, wherein the inner bushing surfaces and the pins have radii greater than one-half of corresponding radii of the rounded ends of both the bushing plates and pin plates.

4,571,230

ENDLESS POWER TRANSMISSION BELT HAVING A TOOTHED COMPRESSION SECTION AND METHOD OF MAKING THE SAME

Carl R. Woodland, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 647,853, Sep. 4, 1984, Pat. No. 4,509,938, which is a continuation of Ser. No. 303,255, Sep. 17, 1981, abandoned. This application Feb. 4, 1985, Ser. No. 698,041
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.⁴ F16G *5/00, 1/00, 9/00*
U.S. Cl. 474—264 **18 Claims**



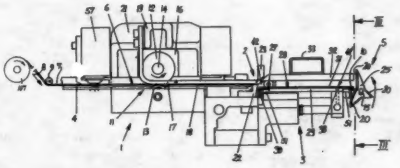
1. In an endless power transmission belt having a toothed compression section, said belt being formed substantially of polymeric materials and comprising a tension section, a compression section, and a load-carrying section disposed between said tension section and said compression section and having a transverse centerline, said compression section having an outer layer and an inner layer joined to said outer layer and defining an interface therewith that is substantially uniformly spaced from said load-carrying section by said outer layer throughout substantially the entire width and length of said belt, said compression section having an inner surface in the form of alternating transverse teeth and grooves with said grooves respectively defining the roots of said teeth, said inner layer of said compression section having a thickness from said interface to the tips of said teeth thereof that is approximately the same as the thickness of said outer layer of said compression section, the improvement wherein said inner layer of said compression section is softer than said outer layer thereof and said roots of said teeth are spaced inwardly from said interface of said layers so that said root of each tooth is spaced from said interface of said layers a distance that is approximately 25% of the distance of that root from said centerline of said load-carrying section whereby said inner layer tends to prevent cracking of said belt in the toothed area thereof, said belt being a CNA belt whereby said tension section is toothed and is formed from two layers in substantially the same manner as said toothed compression section except that the outer layer of said tension section is substantially the same as said inner layer of said compression section and the inner layer of said tension section is substantially the same as said outer layer of said compression section.

4,571,231

METHOD OF MAKING BLANKS FOR USE IN CIGARETTE PACKING MACHINES OR THE LIKE

Willy Rudszinat, Dassendorf, and Karl-Heinz Pawelko, Marschacht, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,480
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1982, 3200335
Int. Cl.⁴ B31B *1/00*
U.S. Cl. 493—11 **5 Claims**



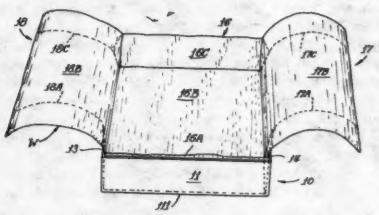
1. A method of subdividing a web into discrete sections, particularly for subdividing a web of wrapping material into a succession of discrete blanks preparatory to conversion of such blanks into the constituents of soft packs for arrays of cigarettes or the like, comprising the steps of moving the web lengthwise in a predetermined direction and in stepwise fashion across a fixed cutting plane so that the foremost portion of the web is located at one side and the remaining portion of the web is located at the other side of such cutting plane; making cuts across the web during the intervals of dwell of the web between successive stepwise movements so that the foremost portion is separated from the remaining portion of the web and such portions of the web are provided with corners disposed at the respective sides of the cutting plane; and removing at least one corner from at least one portion of the web during each interval of dwell of the web.

4,571,232

FOLDING CARTON WITH PREFITTED INTERIOR WRAPPING

Philip A. Diehl, 482 N. Lexington Dr., Lake Forest, Ill. 60045

Filed Apr. 2, 1984, Ser. No. 595,649
Int. Cl.⁴ B31B *1/14, 7/14, 7/26*
U.S. Cl. 493—96 **4 Claims**



1. A method for making a flattened foldable carton with a prefitted interior wrapping liner, the method comprising the steps of:

die-cutting a flat blank for the carton to a predetermined

length and width and to create side wall corner connections;

tacking a central portion of a sheet of wrapping material to the blank at a location thereon selected to be the bottom of the carton;

creasing the blank and sheet of wrapping material to create side wall fold lines, a four-sided hinged border between the carton bottom and side walls, wherein said wrapping material has a border-corresponding peripheral crease around the central portion of the wrapping material;

folding the creased blank to erect the side walls to be normal to said carton bottom wherein said wrapping material has untacked remaining portions of the sheet being folded at said peripheral crease to create a pair of overlapping side flaps in one direction and folded end flaps in the transverse direction capable of being folded to overlie said overlapping side flaps in a combined flattened arrangement over said carton bottom;

securing the die cut corners of the side walls to form a continuously connected side wall around the carton bottom; and,

folding the carton side walls at said fold lines toward the carton bottom to overlie side wall-adjacent margins of the folded wrapping material and thereby securing the wrapping material in a folded arrangement between the side walls and carton bottom;

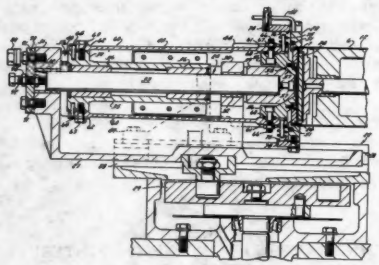
said carton and folded wrapping material thereby being provided in a generally flattened arrangement.

4,571,233

PAPER CONTAINER BOTTOM EXPANDER

Daryl R. Konzal, Colgate, Wis., assignor to Paper Machinery Corporation, Milwaukee, Wis.

Filed Jan. 6, 1984, Ser. No. 568,815
Int. Cl.[4] B31B *1/90, 1/28*
U.S. Cl. 493—109 **6 Claims**



5. A bottom expander for use in making cup-like paper containers, each comprising a bottom blank and a side blank that are joined at a layered bottom rim, whereby the layers of the bottom rim are forced into bonding engagement with one another to form a seal around that rim, said bottom expander comprising a shuttle that defines an axis, a ring tool having an aperture within which a bottom rim is closely receivable and which defines an inner edge surface that surrounds and faces said axis, a plurality of plate-like tool elements disposed in a common plane normal to said axis and each having a radially outer force applying edge surface cooperable with said inner edge surface of the ring tool, and a driver movable forward and rearward along said axis relative to the shuttle and having driving surfaces that are inclined forwardly towards said axis and whereby the tool elements are driven radially outwardly from home positions in consequence of forward movement of the driver, said bottom expander being characterized by:

A. a plurality of elongated leaf springs, one for each tool element, each having a front end portion and a rear end portion,

(1) each having its rear end portion secured to the shuttle in rearwardly spaced relation to the ring tool and at a fixed distance therefrom and so disposed that the leaf spring, when unflexed, has its length substantially parallel to said axis, and

(2) each being flexible substantially only in directions that carry its front end toward and from said axis;

B. a carrier for each leaf spring whereby the tool element for the leaf spring is connected with the leaf spring, each carrier being fixed to the front end portion of its leaf spring and having

(1) a forwardly projecting portion upon which its tool element is secured in forwardly spaced relation to the leaf spring, and

(2) a driven surface complementary to one of said driving surfaces and at least a rear portion of which is behind the front end of the leaf spring and is slidingly engaged by that driving surface during forward movement of the driver;

C. a spring seat abutment on the shuttle for each leaf spring, each said spring seat abutment being in rigidly fixed relation to the ring tool, rearwardly adjacent thereto, and having a spring seat surface which opposes and is spaced from the front end portion of its leaf spring at the side thereof remote from said axis; and

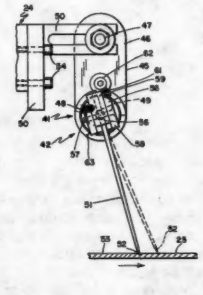
D. spring means reacting between each said spring seat surface and its opposing front end portion of a leaf spring to yieldingly oppose motion of said front end portion of the leaf spring away from said axis and thus constrain the leaf spring to compound flexing whereby its tool element is confined to translatory motion outwardly away from and inwardly to said home position.

4,571,234

NON-REBOUND MECHANISM FOR RIGHT ANGLE TRANSFER IN FOLDER GLUERS

Raymond A. Labombarde, Daniel Webster Highway South, Nashua, N.H. 03061

Filed Aug. 9, 1984, Ser. No. 639,123
Int. Cl.[4] B31B *1/58*
U.S. Cl. 493—182 **6 Claims**



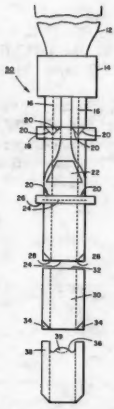
1. A right angular paper box blank folding machine having a first flap-folding zone terminating in a pair of nip rolls, a second flap-folding zone at right angles to said first zone, a blank transfer zone at the junction of said zones, and means, in said blank transfer zone, for moving a plurality of said blanks, received in said transfer zone from said first zone nip rolls, individually and successively across said transfer zone into said second zone characterized by:

sharp pointed means, in said transfer zone, having sharp points riding on one surface of each individual and successive blank received therein from said nip rolls for unyieldably preventing said blanks from returning into the nip of said rolls buy yieldably permitting said blanks to be moved laterally at right angles into said second folding zone in said transfer zone.

4,571,235
METHODS FOR PREPARING FLAT-BOTTOM THERMOPLASTIC SACK AND SYSTEMS THEREFORE

Gordon L. Benoit, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 606,319, May 2, 1984, abandoned. This application Jun. 19, 1985, Ser. No. 746,924
Int. Cl.[4] B31B *37/14, 37/60;* B32B *31/00*
U.S. Cl. 493—195 30 Claims



1. A method of continuously preparing an at least substantially flat, rectangular-bottom thermoplastic film sack comprising:

(a) providing a flattened gusseted tube of thermoplastic film;

(b) opening a gusset fold on each side of said collapsed tube to their full lay-flat extent;

(c) forming in each of the four gusset folds, a diagonal sealed seam over the portions of the tube width corresponding to the gussets along lines diagonal to the length of the tube so that the ends of the sealed seams of adjacent gusset folds are at least closely spaced or in contact so as to form an angle of at least approximately 90°;

(d) returning said gusset folds to their original position so that their seal-pairs are superimposed;

(e) forming a transverse sealed seam across said tube along a line which includes the inboard ends of said pairs of diagonal seams;

(f) forming a pre-weakened transverse line closely adjacent and parallel to said transverse sealing seam;

(g) removing the four double film triangular regions bounded by said diagonal seams, said transverse seam and the side edges of said tube; and

(h) collecting the resulting structures while still interconnected at said preweakened transverse lines.

23. A system for preparing an at least substantially flat, rectangular-bottom, thermoplastic film sack comprising in combination:

(a) means for forming a tube of thermoplastic film;

(b) means for collapsing said tube including means for simultaneously forming therein two oppositely disposed, parallel, gussets;

(c) means for opening, simultaneously or spatially sequentially, a gusset fold on each side of said collapsed tube to their full, lay-flat extent;

(d) means for simultaneously or spatially sequentially forming in each of the four gusset folds a diagonal seam over the portion of the tube width corresponding to the gussets along lines diagonal to the length of the tube so that the ends of the sealed seams of adjacent gusset folds are at least closely spaced or in contact so as to form an angle of at least approximately 90°;

(e) means for returning said gusset folds to their original position so that their seal-pairs are superimposed;

(f) means for forming a transverse sealed seam across said tube along a line which includes the inboard ends of said pairs of diagonal seams and means for simultaneously forming a pre-weakened transverse line closely adjacent and parallel to said transverse sealed seams;

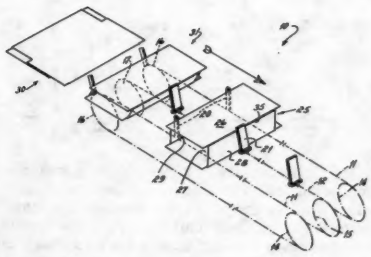
(g) means for removing four double film triangular regions bounded by said diagonal seams said transverse seam and the side edges of said tube; and

(h) means for collecting the resulting structures while still interconnected at said pre-weakened transverse lines.

4,571,236
CARTON SQUARING MECHANISM

Charles W. Adams, Walton, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Filed Dec. 5, 1983, Ser. No. 558,330
Int. Cl.[4] B31B *3/78;* B65G *15/10, 19/02, 49/00*
U.S. Cl. 493—319 2 Claims



1. In a cartoner having a transport conveyor, the transport conveyor comprising opposed pairs of laterally spaced sprockets, spaced parallel endless chains passing around respective pairs of opposed sprockets, each conveyor chain having an upper horizontal run and carrying spaced upwardly-projecting trailing transport lugs, opposed center sprockets disposed between said laterally spaced sprockets and a center endless chain passing around said center sprockets and having an upper horizontal run, said center chain carrying a series of spaced upwardly-projecting leading transport lugs, said center chain being longitudinally adjustable to vary the spacing between the trailing and leading lugs, means for squaring a carton deposited between said leading and trailing lugs, said carton in its flat folded condition having a downwardly-facing leading side wall, said squaring means comprising means for maintaining each said leading lug in a rearwardly-inclined attitude and said trailing lugs in a vertical attitude when on said upper run wherein said leading lug engages the upper corner of said carton between said leading side wall and an upper wall to urge and maintain said carton corners to a right angle attitude.

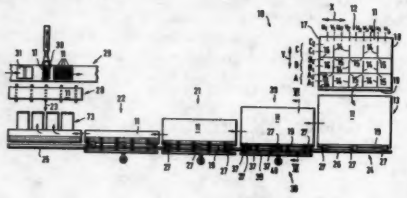
4,571,237
PROCESS AND APPARATUS FOR FOLDING A SHEET LONGITUDINALLY AND TRANSVERSELY

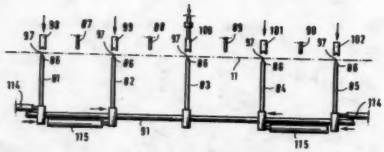
Alfred Vogtländer, Hermsdorf über Waldbröl, Fed. Rep. of Germany, assignor to Falk-Verlag für Landkarten und Stadtpläne Gerhard Falk GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 1, 1984, Ser. No. 616,399
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320731
Int. Cl.[4] A31F *1/00*
U.S. Cl. 493—416 18 Claims

2. A device for forming longitudinal and transverse folds in a sheet in which a plurality of said longitudinal folds are to be Leporello folds, offset relative to each other in the transverse direction, said longitudinally folded sheet then being provided

with transverse folds offset above each other as Leporello folds, said device comprising: a plurality of longitudinal fold stations sequentially arranged in the direction of the longitudinal folds in the sheet, each longitudinal fold station having first and second sides of the sheet thereby providing lower and upper longitudinal folds in said sheet; a transverse fold station, having a plurality of transverse fold plates having means connected thereto for moving said plates laterally together in the direction of the longitudinal folds and pressure elements having means for simultaneously moving said elements transversely to the longitudinal folds between said transverse fold plates; and a conveyor system arranged along and adjacent said plurality of longitudinal fold stations, said conveyor system moving said sheet to each longitudinal fold station and to the transverse fold station in sequence.





4,571,238

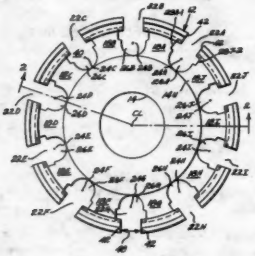
CENTRIFUGE ROTOR HAVING A RETAINING ARRANGEMENT THEREON

Raymond G. Potter, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 9, 1983, Ser. No. 530,653

Int. Cl.[4] B04B *5/02*

U.S. Cl. 494—12 **16 Claims**



1. In a centrifuge rotor of the type having a body with arms cooperating to form in the rotor a peripheral groove the axis of which is substantially parallel to the axis of rotation of the rotor, the confronting face of each arm having a slot therein, each slot having a predetermined dimension measured in a substantially radial direction with respect to the rotor, the slots cooperating to receive a tube carrier and support the same in edgewise relationship, the tube carrier having a predetermined thickness dimension measurable in a substantially radial direction of the rotor when the carrier is supported in the slots, wherein the improvement comprises a retaining member disposed on the rotor, a predetermined portion of the retaining member overlying at least one of the slots for a predetermined distance measured in a substantially radial direction of the rotor, the radial dimension of the one slot being greater than the sum of the radial distance by which the retaining member overlies the slot and the radial thickness dimension of the tube carrier.

4,571,239

CATHETER-STYLET ASSEMBLY FOR SLIPOVER URETHRAL INSTRUMENTS

Arnold M. Heyman, 3573 Terrace View Dr., Encino, Calif. 91436

Continuation of Ser. No. 550,231, Nov. 8, 1983, abandoned, which is a continuation of Ser. No. 379,480, May 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 353,432, Mar. 1, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 671,055

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—54 **17 Claims**

11. A urethral instrument system comprising a filiform and a dilator for passing through the urethra and into the bladder, said filiform comprising a thin elongated flexible hollow tube having an open distal end and a smoothly contoured, tapered and curved proximal end which can be readily passed through the urethra and into the bladder, said filiform having an opening in the side thereof near the proximal end for the drainage of fluid to indicate that the filiform has reached the bladder, and said dilator comprising an elongated hollow tube having (a) open distal and proximal ends, the proximal end being smoothly contoured and (b) a uniform inner diameter that is slightly larger than the outer diameter of the filiform,

said urethral instrument being structured such that after the filiform is passed through the urethra and into the bladder said dilator can be slidably passed coaxially over said filiform to dilate the urethra.

13. The instrument of claim **11** wherein the hollow tube of the filiform has a substantially uniform inner diameter to accomodate the insertion and removal of a wire stylet within the filiform.

4,571,240

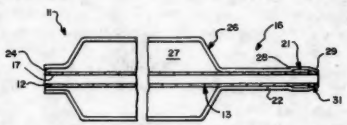
CATHETER HAVING ENCAPSULATED TIP MARKER

Wilfred J. Samson, Saratoga, and Jeffrey S. Frisbie, San Jose, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Aug. 12, 1983, Ser. No. 522,820

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—96 **7 Claims**



1. In a catheter, a first elongate flexible member having a cylindrical outer surface and having proximal and distal ends, a metallic band of radio opaque material disposed on the outer

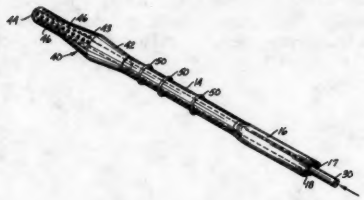
surface of the elongate member in the vicinity of the distal end of the elongate member, a tubular member of a flexible material carried by the distal end of the elongate member and encapsulating the metallic band to prevent its accidental dislodgment from the tip of the catheter the tubular member having formed therein, at the distal end thereof, an annular recess which receives the metallic band.

4,571,241

URINARY CATHETER WITH COLLAPSIBLE URETHRAL TUBE

T. Graham Christopher, 8727 Talbot Rd., Edmonds, Wash. 98020

Filed Dec. 16, 1983, Ser. No. 562,094
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—104 **12 Claims**



1. A urinary catheter comprising:

a urethral tube, said tube being constructed of pliant material and having longitudinal fibers therein, said fibers being oriented axially in relation to the longitudinal axis of said tube, said tube having an interior bore and being of sufficient length to extend through the urethra and out of the body from the area adjacent the bladder neck, said tube being normally collapsed within the urethra but radially distended by a flow of urine through the bore, said interior bore being closed when said tube is collapsed and open when said tube is radially distended;

a noncollapsible bladder tube connected at its proximal end to the distal end of said urethral tube, said bladder tube having an interior bore and being of sufficient length to extend into the bladder from the area adjacent the bladder neck, the interior bores of said tubes being cooperatively connected to form a drainage channel; and

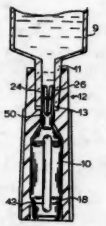
retaining means for releasably retaining said catheter after insertion.

4,571,242

TAMPER PROOF CAP FOR SYRINGES AND THE LIKE

Richard B. Klein, Warren, and William S. Scavuzzo, Clark, both of N.J., assignors to C. R. Bard, Inc., N.J.

Filed Jun. 19, 1984, Ser. No. 622,215
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—111 **21 Claims**



1. A tamper-proof closure for a syringe comprising:

a tubular member having a first orifice for receiving a syringe tip and a second orifice communicating with said first orifice;

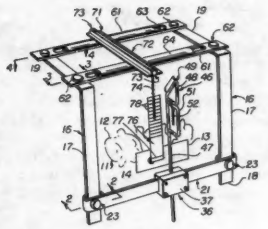
a plug with a first portion having a first configuration in which said first portion prevents a syringe tip from being inserted into said first orifice when said first portion is in said first orifice and further cooperates with said member to trap said plug when said plug is disposed in said second orifice with said first portion extending into said first orifice; said plug being deformable to a second configuration for sealing said syringe tip, said tubular member being constructed and arranged to deform said first portion into a sealing engagement with said syringe tip as said plug is introduced into said second orifice.

4,571,243

NEEDLE GUIDANCE SYSTEM

Edward C. Froning, P.O. Box 1768, Rancho Santa Fe, Calif. 92067, and Gregory S. Graham, Ventura, Calif., assignors to Edward C. Froning, Santa Fe, Calif.

Filed May 18, 1983, Ser. No. 495,664
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—116 **6 Claims**



1. A needle guide of the type having a pair of right-angle supports having vertical and horizontal members, a lower bridge frame extending horizontally across both said vertical members, first clips fixed to opposite ends of said lower bridge frame engaging said vertical members, a bridge clip adjustably slidable along said lower bridge frame, a cannula guide having a stem vertically slidable in said bridge clip and having a downward-inward slanted channel, a forward and a rearward horizontal longitudinal heading guide extending across both said horizontal members, second clips fixed to opposite ends of said heating guides engaging said horizontal members, a disc overlay extending transversely to said heading guides, disc overlay holding means holding said disc overlay in engagement with said heading guides and plumb means depending from the forward end of said disc overlay,

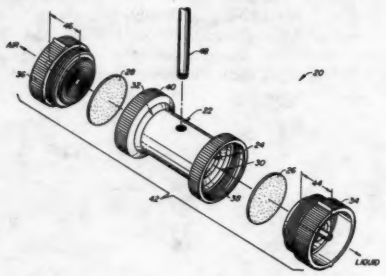
the improvement which comprises said right angle supports being of magnetizable material, said first clips each comprising a hollow first stem passing through said lower bridge frame, a first magnet in said first stem magnetically engageable with said vertical member and means securing said first stem fixed to said lower bridge frame, said second clips each comprising a hollow second stem passing through one said heading guide, a second magnet in said second stem magnetically engageable with said horizontal members and means securing said second stem fixed to said heading guide.

4,571,244

SYSTEM FOR REMOVING GAS BUBBLES FROM LIQUIDS

David R. Knighton, San Francisco, Calif., assignor to Biogenesis, Inc., San Francisco, Calif.

Filed May 7, 1984, Ser. No. 607,370
Int. Cl.[4] A01M *5/16*
U.S. Cl. 604—118 **4 Claims**



1. A system for selectively and alternately either measuring central venous pressure of a patient or introducing a liquid substantially free of gas bubbles into the venous system of a patient, the system comprising:

(a) a liquid supply;

(b) a manometer, having first and second ends;

(c) a means for filtering, connected between the first end of the manometer and the patient, provided with a chamber having a hydrophilic filter for passing liquid but not gas bubbles to the patient, and a hydrophobic filter for passing gas bubbles but not liquid out of the chamber and away from the patient; and

(d) a selector valve having first and second open positions, the first position placing ambient atmospheric air into communication with the second end of the manometer to permit measurement of central venous pressure of the patient, and the second position placing the liquid supply in communication with the second end of the manometer to supply liquid substantially free of gas bubbles to the patient.

4,571,245

PERSONAL CATHETER LEG STRAP

Vance M. Hubbard, Euless, and Welton K. Brunson, Bedford, both of Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

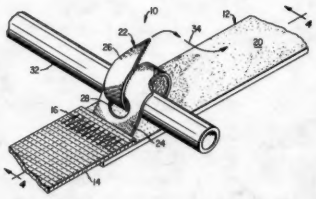
Filed Mar. 28, 1983, Ser. No. 479,671
Int. Cl.[4] A61M *25/02*
U.S. Cl. 604—179 **1 Claim**

1. An apparatus for securing a catheter tube to a portion of the anatomy of a patient adjacent a catheter insertion point, comprising:

a strap for wrapping about the desired portion of the anatomy of the patient, said strap having a first elastic portion for stretching and a second portion having a layer of fibrous material disposed on one side for receiving Velcro-type attaching layer, said first portion having a length roughly similar to the length of said second portion, said first and second portions each having an end joined to each other at a junction, said first and second portions each having a free end;

a strip of Velcro-type material attached to the free end of said first portion for mating with the free end of said second portion, said second portion having the fibrous material thereon to form an attachment therebetween;

a securing band having Velcro-type hook members disposed on one side thereof, said securing band attached at said junction between the first and second portions thereof to lie parallel and over the second portion, when not in use so that said hook members face downward, said securing band including a first portion having a circular orifice disposed therethrough adjacent the attached end and a second portion integrally attached to said first portion



proximate the orifice, the width of said second portion being less than the width of said first portion and also the width of said first portion being less than the width of said strap, the width of said second portion being less than the diameter of said orifice through the entire length of said second portion, said second portion having a pointed free end for insertion through said orifice;

said securing band operable to wrap around the catheter tube one revolution for insertion of said second portion through said orifice and further wrap around the catheter tube essentially one-half revolution for attachment of the Velcro-type hook members on the surface of said securing band to the fibrous material on the surface of said strap at any of a plurality of locations such that said catheter tube is secured against the surface of said strap vertically and laterally by said securing band providing a downward force on the catheter tube directed toward the strap, whereby any one of a plurality of catheter tubes having different diameters may be comfortably and securely attached to the patient's leg.

4,571,246

PROCESS FOR THE PRODUCTION OF DISCHARGE RESIST PRINTS ON HYDROPHOBIC TEXTILE MATERIALS: HYDROGEN SULPHIDE SALT, POLYSULPANE OR THIOLATE

Ulrich Bühler, Alzenau; Theo Stahl; Konrad Mix, both of Frankfurt, and Kurt Roth, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,590

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339158

Int. Cl.[4] D06P *1/16, 3/26, 5/15*

U.S. Cl. 8—456 **11 Claims**

1. In the process for production of discharge resist prints on textile material which contain hydrophobic fibers wherein at least one disperse dyestuff dischargeable to white with or without at least one discharge-resistant disperse dyestuff is applied, in the form of a dye liquor or printing paste, to the textile material and a discharge resist printing paste is printed on the material in the desired pattern, and the material is subsequently subjected to heat treatment at 100° to 230° C.,

wherein the improvement comprises the discharge resist printing paste containing, as the discharging agent, at least one salt of hydrogen sulphide, polysulphanes, compound having a thiolate group of the formula $-S^{\ominus}$ or a tautomerizable thiogroup of the formula $=S$, and mixtures thereof.

4,571,247

PRODUCT IN TABLET FORM FOR USE IN THE CHEMICAL ELIMINATION OF SOOT FROM CHIMNEYS AND SMOKE DUCTS

Bruno Barbieri, Cremona, Italy, assignor to Cavallino S.N.C. Prodotti Chimici, Cremona, Italy

Filed Feb. 27, 1985, Ser. No. 706,098

Claims priority, application Italy, Mar. 19, 1984, 20119 A/84

Int. Cl.[4] C10L *10/00, 10/02, 10.04;* **C01L** *10/06*

U.S. Cl. 44—5 **3 Claims**

1. A product in tablet form for eliminating soot and other carbon deposits from chimneys and smoke ducts, consisting essentially of the following components:

cupric chloride from 5% to 15% by weight

ammonium chloride from 1% to 5% by weight

stearin and/or paraffin from 65% to 85% by weight

tableting binders and auxiliaries selected from the group consisting of talc and starch from 5% to 15% by weight

sulphur from 0.2% to 5% by weight

4,571,248

FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 456,880, Jan. 10, 1983, Pat. No. 4,486,321. This application Aug. 7, 1984, Ser. No. 638,609

Int. Cl.[4] C10L *1/30*

U.S. Cl. 44—53 **13 Claims**

1. A liquid fuel composition comprising a major proportion of (a) liquid hydrocarbon or alcoholic fuel and a friction reducing amount of a reaction product obtained by (1) reacting a hydrocarbyl mono- or diamine having 10 to 30 carbon atoms with a mercaptan and an aldehyde, the reaction taking place at from about 80° to about 160° C. using molar ratios of amine:aldehyde:mercaptan of from about 1:1:0.5 to about 1:1:1 and (2) reacting the resulting product at from about 90° C. to about 150° C. with a sufficient amount of a boron compound to give from about 0.1% to about 10% of boron in the final product.

4,571,249

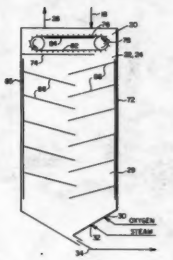
APPARATUS FOR THE CONVERSION OF COAL TO GAS, LIQUID AND SOLID PRODUCTS

Jack I. Bonasso, 9 Main St., Carolina, W. Va. 26563; James T. Harper, 5940 Mallory Rd., College Park, Ga. 30349, and Francis K. Verhoff, Morgantown, W. Va., assignors to Jack I. Bonasso, Carolina, W. Va. and James T. Harper, Chamblee, Ga.

Filed Aug. 15, 1983, Ser. No. 523,272

Int. Cl.[4] C10J *3/58*

U.S. Cl. 48—73 **8 Claims**



1. Apparatus for the conversion of coal to gas, liquid and solid products, said apparatus comprising a single vessel including;

a pyrolysis chamber having an inlet for coal and an outlet for gas, said pyrolysis chamber being disposed in the upper part of said vessel;

a gasification chamber having an inlet for oxygen and steam and an outlet for a solid product, said gasification chamber being disposed in the lower part of said vessel;

means interconnecting said pyrolysis chamber and said gasification chamber comprising a common dividing wall extending substantially across the vessel, said wall having aperature means for delivering all solid residue generated in said pyrolysis chamber to said gasification chamber and for delivering all hot gases generated in said gasification chamber to said pyrolysis chamber, said common wall transferring heat from the gasification chamber to the pyrolysis chamber by conduction;

transport means in said pyrolysis chamber for moving coal along said common wall to said aperture means;

at least one baffle in said gasification chamber extending inwardly and downwardly from an inner wall of said vessel such that the solid residue from the pyrolysis chamber passing through said aperture means to the gasification chamber will contact said baffle;

means for removing gas leaving said gas outlet of said pyrolysis chamber and delivering said removed gas to a location separated from said pyrolysis chamber, and

means for cooling gas delivered to said location to condense some of said gas while leaving some of said gas in gaseous form.

4,571,250

ASH CONTAINER

Edward Irmscher, Star Rt., Hortonville, N.Y. 12745, and Jesse L. Colodner, 322 Orangeburg Rd., Pearl River, N.Y. 10965

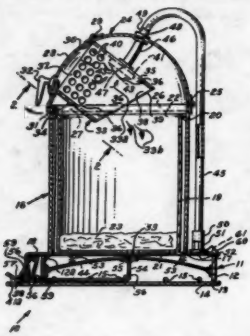
Filed Jun. 15, 1984, Ser. No. 621,211

Int. Cl.[4] B01D *46/44;* **B65D** *51/18*

U.S. Cl. 55—359 **9 Claims**

1. An ash container comprising: a base, a container secured to said base, a vacuum producing mechanism secured in said base, a chute secured in said container for receiving ashes removed from a woodstove or fireplace, a hose communicating said vacuum producing mechanism with the interior of said chute through a filter secured in said chute so that a vacuum is

created in said chute and said filter retains ash dust and prevents said ash dust from traveling through the air on the out-



side of said container, and an ash receptacle received in said container and disposed below said chute.

4,571,251

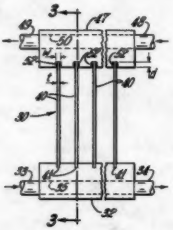
APPARATUS FOR PRODUCING GLASS FIBERS

Timothy A. Sullivan, Newark, Ohio, and Gregory L. Morgan, Jackson, Tenn., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 2, 1984, Ser. No. 657,109

Int. Cl.[4] C03B *37/025*

U.S. Cl. 65—12 **5 Claims**



1. Apparatus for producing continuous glass filaments comprising

a feeder for supplying streams of molten glass to be attenuated into filaments,

means for attenuating the streams into continuous filaments, and

an environmental control means adapted to remove heat from the fiber forming region comprised of a plurality of fin-like members positioned between the streams of molten glass being attenuated into filaments, the first end of said members being permanently secured to a first manifold adapted to flow cooling fluid therethrough and the second end of said members being in contact with a second manifold adapted to flow cooling fluid therethrough, said fin-like members being slidably positioned within notches in said second manifold to permit the fin-like members and first manifold to be replaced in the absence of breaking the continuous filaments.

4,571,252

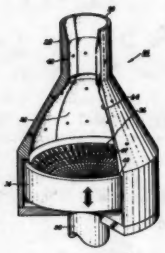
LAMP GLASS ENVELOPE AND METHOD FOR MANUFACTURE A LAMP GLASS ENVELOPE

Raymond J. Noe, Warren, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 519,437, Aug. 1, 1983. This application Oct. 22, 1984, Ser. No. 663,269

Int. Cl.[4] C03B *9/12*

U.S. Cl. 65—82 **6 Claims**



1. A method of continuously forming a blown glass envelope for a reflector type lamp from a molten ribbon of glass supported on a moving conveyor which comprises:

(a) blowing a portion of the glass from said molten ribbon into the central cavity of a single multi-part mold, said mold including a pair of cooperative halves forming the curved reflector portion of said blown glass envelope by encircling the molten glass while being blown and which mold further includes a separate base part located at the lower end of said cavity forming a flattened face of lesser curvature in said blown glass envelope having light distributing elements on the exterior surface,

(b) said base part being provided with reciprocal motion in a vertical direction,

(c) having the base part of said mold move upwardly and remain in an upward position while the glass envelope is being blown to form all structural features in said glass envelope but then move downwardly and release the face of the solidified blown glass envelope before the mold halves are opened,

(d) opening the mold halves to release the sides of the solidified blown glass envelope, and

(e) severing the blown glass envelope from the moving glass ribbon.

4,571,253

PRESS BENDING APPARATUS

Robert G. Revells, and Allan T. Enk, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

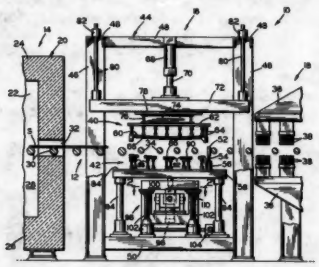
Filed Jul. 26, 1984, Ser. No. 634,424

Int. Cl.[4] C03B *23/03*

U.S. Cl. 65—273 **6 Claims**

1. In a glass sheet bending apparatus of the type having a bending member and a fluid actuator including a piston operatively connected to the bending member, the improvement comprising a movable frame for supporting the bending member, means operatively connected to said movable frame for

reciprocally moving said frame, said means comprising a plurality of screwjacks and mechanism for rotating said screwjacks in unison, and means for mounting the fluid actuator on said movable frame for movement therewith.

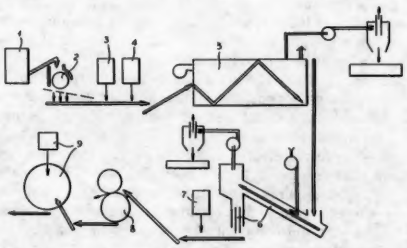


4,571,254

METHOD FOR PRODUCING FERTILIZER FROM TREE ASH AND SOFTWOOD BARK OR FROM OTHER TREE WASTE

Arvo Wahlberg, Soukan rantatie 16C, SF-02360 Espoo 36, Finland

Filed Nov. 8, 1984, Ser. No. 669,607
Claims priority, application Finland, Mar. 28, 1984, 841230
Int. Cl.[4] C05F *11/02*
U.S. Cl. 71—24 **12 Claims**



1. A process for the preparation of a fertilizer composition containing old softwood bark or tree waste which comprises the following steps:

(a) grinding the old softwood bark or tree waste;

(b) adding peat to the ground old softwood bark or tree waste to form a mixture;

(c) heating the mixture formed in step (a) to a temperature of 70° to 140° C. at a pressure of 1 to 1.6 atmospheres to decompose the mixture;

(d) cooling and devaporizing the mixture decomposed during step (c) thereby adjusting the temperature to 90° C. or less;

(e) treating the mixture with 20 to 30 kg/m^3 of a 46% urea solution;

(f) granulating the urea-treated mixture; and

(g) coating the grains obtained in step (f) with ash.

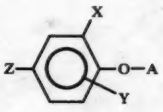
4,571,255

SUBSITUTED PHENOXYBENZISOXAZOLE HERBICIDES

Donald R. Nielsen, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

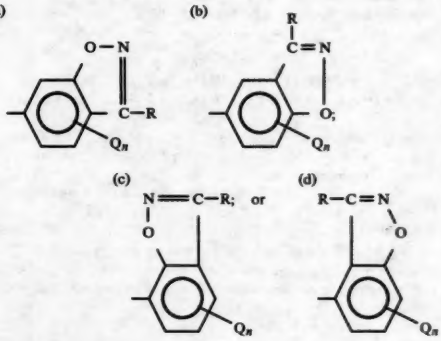
Filed Dec. 29, 1983, Ser. No. 566,745
Int. Cl.[4] C07D *261/20*; A01N *31/08*
U.S. Cl. 71—88 **4 Claims**

1. A compound represented by the formula:

 I

wherein:

A is a benzisoxazole radical selected from:



wherein:

X and Y are hydrogen, halogen, C_1 to C_4 haloalkyl, nitro or cyano;

Z is halogen, C_1 to C_4 alkylsulfonyl, aminosulfonyl or C_1 or C_4 haloalkyl;

R is hydrogen, halogen, cyano, amino, mono- or dialkylamino, hydroxy, C_1 to C_4 alkyl or haloalkyl, C_1 to C_4 alkoxy, haloalkoxy or alkylthio, phenyl or substituted phenyl, phenoxy or substituted phenoxy, carboxy or alkoxycarbonyl;

Q is halogen, nitro, cyano or C_1 to C_4 haloalkyl; and n=0–2.

4,571,256

NITROGEN FERTILIZER MANIFESTING FUNGICIDAL PROPERTY AGAINST PATHOGENIC FUNGI

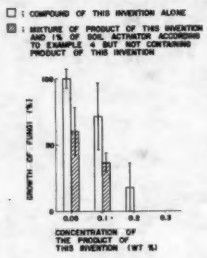
Shigeki Takagi, Tokyo, and Yumiko Urayama, Chigasaki, both of Japan, assignors to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho, Tokyo, Japan

Continuation of Ser. No. 442,896, Nov. 19, 1982, abandoned. This application May 14, 1985, Ser. No. 734,238
Claims priority, application Japan, Nov. 24, 1981, 56-186957
Int. Cl.[4] E05B *37/06, 37/10, 37/18*
U.S. Cl. 71—28 **10 Claims**

1. A method of supplying fertilizer to plants comprising the steps of:

preparing aqueous solution of nitrogen fertilizer manifesting fungicidal property against pathogenic fungi and containing as its effective component a water soluble initial condensa-

tion product containing methylol radicals and prepared by causing formaldehyde to react with urea at a PH higher than


□ : COMPOUND OF THIS INVENTION ALONE
▨ : MIXTURE OF PRODUCT OF THIS INVENTION AND 1% OF SOIL ACTIVATOR ACCORDING TO EXAMPLE 4 BUT NOT CONTAINING PRODUCT OF THIS INVENTION
GROWTH OF FUNGI (%)
100
50
0
0.05
0.1
0.2
0.3
CONCENTRATION OF THE PRODUCT OF THIS INVENTION (WT %)

7, said aqueous solution containing said nitrogen fertilizer in an amount of 0.043–0.036%, and

applying said aqueous solution to plants.

4,571,257

HERBICIDAL ESTERS OF N-SUBSTITUTED 2-BROMO-4-METHYLIMIDAZOLE-5-CARBOXYLIC ACID

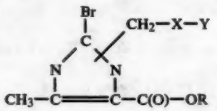
Andrea Leone-Bay, Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 6, 1985, Ser. No. 730,964

Int. Cl.[4] A01N *43/50*; C07D *233/90*

U.S. Cl. 71—92 **18 Claims**

10. The method of controlling undesirable vegetation comprising applying to the are where control is desired an herbicidally effective amount of a compound having the structural formula



wherein R is C_1–C_{10} alkyl; X is oxygen, sulfur, sulfoxide or sulfone; and Y is C_1–C_6 alkyl, phenyl or substituted phenyl wherein the substituent is halogen.

4,571,258

RECOVERY OF ALUMINIUM SCRAP

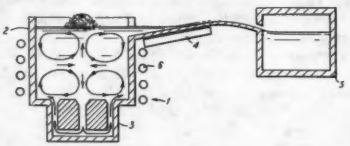
Pervez J. F. Bamji, and Nigel P. Fitzpatrick, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed May 21, 1984, Ser. No. 612,309

Claims priority, application United Kingdom, May 26, 1983, 8314577

Int. Cl.[4] C22B *21/00*

U.S. Cl. 75—10 R **10 Claims**



1. A process for recovery of coated light gauge aluminium scrap which comprises

(i) continuously decoating the scrap,

(ii) feeding the decoated scrap substantially continuously to a body of molten aluminium, having an upright axis, at least one channel-type induction heating stage being arranged beneath said body of molten aluminium for heating molten aluminium of said body,

(iii) stirring such body of molten aluminium to submerge said scrap therein,

(iv) continuously supplying heat to said body of molten aluminium by energizing said at least one channel-type induction heating stage, and

(v) substantially continuously withdrawing molten aluminium from said body of molten aluminium.

4,571,259

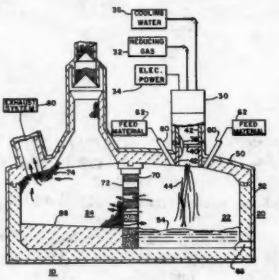
APPARATUS AND PROCESS FOR REDUCTION OF METAL OXIDES

Maurice G. Fey, Plum Boro, Pa.; John H. Fatum, Brecksville, Ohio, and Thomas N. Meyer, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1985, Ser. No. 692,810

Int. Cl.[4] C22B *4/00, 4/08*

U.S. Cl. 75—10 R **57 Claims**



1. An apparatus for the direct reduction of a feed material including a reductant, a slag former, and a comminuted metal oxide in a plasma heated stream wherein the metal produced forms a metal bath therein, comprising:

enclosed horizontal reactor means having a reduction chamber for containing the metal bath and an adjacent filter chamber in communication with and drainable into the reduction chamber;

non-transferred electric arc plasma torch means for heating a reducing gas to form heated plasma heated stream, the plasma torch means positioned approximate the top of the reactor means and in communication with the reduction chamber allowing for the introduction of the plasma heated stream into the reduction chamber such that the plasma heated stream is directed substantially toward the floor of the reduction chamber;

feeding means for introducing the feed material into the plasma heated stream such that a majority of the metal and slag produced separates from the plasma heated stream and collects in the lower portion of the reduction chamber forming the metal bath having a slag layer on the surface thereof with the plasma heated stream impinging on the metal bath thereby heating and mixing the metal bath;

tapping means for the removing of the metal from the metal bath to substantially eliminate overflow of the metal bath into the filter chamber;

filter means substantially filling the filter chamber for filtering the plasma heated stream, the filter means comprising particulated coke; and

exhaust means in communication with the filter chamber for removing the plasma heated stream from the reactor means by drawing the plasma heated stream from the

reduction chamber into the filter chamber and through the filtering means whereby the filtering means removes substantially all of the molten metal remaining in the plasma heated stream with the recovered metal and slag draining from the filter chamber into the metal bath of the reduction chamber for recovery, the separation between the filter chamber and the reduction preventing the entry of the coke of the filter means into the reduction chamber thereby preventing carbon saturation of the metal bath by the filtering means.

4,571,260

METHOD FOR RECOVERING THE METAL VALUES FROM MATERIALS CONTAINING TIN AND/OR ZINC

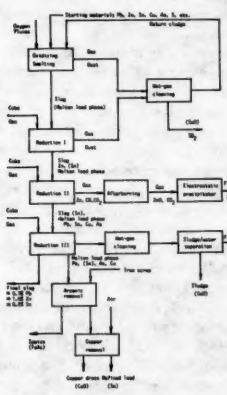
Leif Johansson; Stig A. Petersson, and Bengt O. Rudling, all of Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Jan. 29, 1985, Ser. No. 696,095

Claims priority, application Sweden, Feb. 7, 1984, 8400625; Sep. 4, 1984, 8404418

Int. Cl.[4] C22B *13/00, 19/04, 25/00*

U.S. Cl. 75—21 **18 Claims**



1. A method of recovering metal values from materials containing lead and at least one of zinc and tin comprising:

(a) smelting the materials in a furnace in the presence of a flux and under oxidizing conditions to form a molten bath containing a slag which contains lead and at least one of zinc and tin wherein the flux is selected to impart a viscous consistency to the slag at a selected reduction temperature and at low lead contents in the slag;

(b) adding a solid carbonaceous reduction agent to the furnace;

(c) suspending the reduction agent in the slag thereby decreasing the lead content in the slag by reduction;

(d) sustaining the suspension after the lead content of the slag has decreased to below about 2% whereby at least one of zinc and tin is reduced to form a vapor which is removed from the furnace; and

(e) removing molten lead from the furnace.

4,571,261

METHOD FOR RECOVERING LEAD FROM WASTE LEAD PRODUCTS

Kurt J. A. Burén, Skelleftehamn; Martin L. Hedlund, Ursviken, and Malkolm S. Lundström, Skellefteå, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Jun. 25, 1984, Ser. No. 624,193

Claims priority, application Sweden, Jul. 13, 1983, 8303963

Int. Cl.[4] C22B *13/00*

U.S. Cl. 75—77 **18 Claims**

1. A method for recovering lead from lead storage battery scrap by reduction smelting comprising:

(a) introducing a charge comprised of said lead storage battery scrap which contains non-metallic lead compounds including sulfate-containing compounds and a solid reducing agent in an amount sufficient to reduce substantially all of the non-metallic lead compounds present in the lead storage battery scrap into a furnace adapted to impart vigorous agitation to the contents thereof; and

(b) directing a burner onto the charge to heat the charge to a temperature in the range of from 1050° C. to 1250° C. while vigorously agitating the charge whereby the lead storage battery scrap is melted, the sulfate-containing compounds in the charge are converted to sulfur dioxide which is removed from the furnace and a substantially sulfur-free lead melt containing the lead to be recovered is substantially simultaneously formed.

4,571,262

RECOVERY OF PLATINUM GROUP METALS FROM NICKEL-COPPER-IRON MATTE

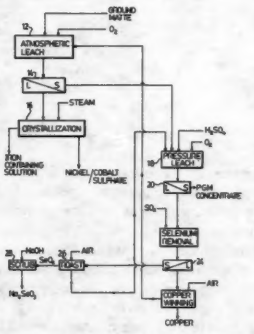
Derek G. E. Kerfoot, St. Albert; Russell P. Kofluk, Opal, and Donald R. Weir, Fort Saskatchewan, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Mar. 11, 1985, Ser. No. 710,738

Claims priority, application Canada, Oct. 24, 1984, 466221

Int. Cl.[4] C22B *11/04;* **C01G** *3/00, 53/00*

U.S. Cl. 75—101 R **9 Claims**



1. A process for separately recovering platinum group metal values, nickel values and copper from nickel-copper-iron sulphidic matte containing platinum group metals comprising:

leaching ground matte at atmospheric pressure in acidic nickel-copper sulphate solution at a temperature in the range of from about 75 to about 105° C. and at a pH below about 4 initially under oxidizing conditions and subsequently under neutral or non-oxidizing conditions to cause dissolution of nickel and iron, precipitation of copper as a copper sulphide and precipitation of dissolved platinum group metals,

separating copper, nickel and platinum group metal containing solids from nickel and iron containing sulphate solution,

leaching the copper, nickel and platinum group metal con-

taining solids in acidic nickel-copper sulphate solution under pressurized oxidizing conditions at a temperature of from about 120° to about 180° C. to cause dissolution of nickel and copper with minor dissolution of platinum group metals,

separating platinum group metal containing solids from nickel and copper containing sulphate solution,

electrowinning copper from the nickel and copper containing sulphate solution under conditions to cause cathodic deposition of copper without significant deposition of nickel, and

recycling spent nickel and copper containing electrolyte solution also containing minor amounts of dissolved platinum group metals to the atmospheric leach and pressure leaching steps.

4,571,263

RECOVERY OF GOLD FROM REFRACTORY AURIFEROUS IRON-CONTAINING SULPHIDIC CONCENTRATES

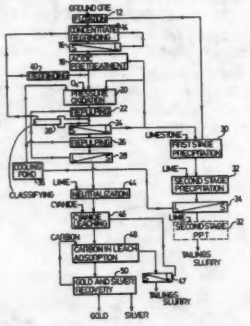
Donald R. Weir, Fort Saskatchewan, and Roman M. Genik-Sas-Berezowsky, Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Mar. 4, 1985, Ser. No. 707,922

Claims priority, application Canada, Sep. 27, 1984, 464179

Int. Cl.[4] C22B *11/04*

U.S. Cl. 75—101 R **11 Claims**



1. A process for recovering gold from refractory auriferous iron-containing concentrate comprising:

feeding the concentrate as an aqueous slurry to an acidic pretreatment step,

treating the concentrate in the acidic pretreatment step with aqueous sulphuric acid solution to decompose carbonate and other acid consuming gangue compounds,

oxidizing the treated slurry in a pressure oxidation step at a temperature in the range of from about 135° to about 250° C. under a pressurized oxidizing atmosphere while manintaing a free acid concentration of from about 5 to about 40 g/L sulphuric acid to cause dissolution of iron, formation of sulphuric acid and oxidation of substantially all oxidizable sulphide compounds to sulphate form with less than about 20% of oxidized sulphur being present as elemental sulphur during the oxidation step,

adding water to the oxidized slurry in a first repulping step to produce a repulped oxidized slurry with a pulp density in the range of from about 5 to about 15% solids by weight,

subjecting the repulped oxidized slurry to a liquid-solids separation step to produce an acid and iron containing solution and oxidized separated solids,

recycling a portion of the acid and iron containing solution to the acidic pretreatment step, and

recovering gold from the oxidized separated solids.

4,571,264

RECOVERY OF GOLD FROM REFRACTORY AURIFEROUS IRON-CONTAINING SULPHIDIC ORE

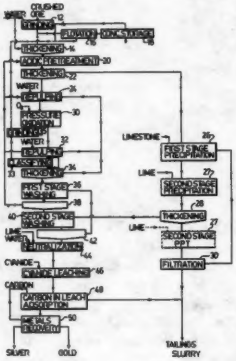
Donald R. Weir, Fort Saskatchewan, and Roman M. Genik-Sas-Berezowsky, Edmonton, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Mar. 4, 1985, Ser. No. 707,923

Claims priority, application Canada, Sep. 27, 1984, 464178

Int. Cl.[4] C22B *11/04*

U.S. Cl. 75—101 R **11 Claims**



1. A process for recovering gold from refractory auriferous iron-containing sulphidic ore comprising:

feeding ground ore as an aqueous slurry to an acidic pretreatment step,

treating the ground ore in the acidic pretreatment step with aqueous sulphuric acid solution to decompose carbonate and acid consuming gangue compounds which might otherwise inhibit a subsequent pressure oxidation step,

subjecting the treated slurry to a first liquid-solids separation step to produce a sulphate solution and separated solids,

adding water to the separated solids in a first repulping step to form a slurry having a pulp density in the range of from about 25 to about 60% by weight solids,

oxidizing the first repulped slurry in a pressure oxidation step at a temperature in the range of from about 135° to about 250° C. under a pressurized oxidizing atmosphere while maintaining a free acid concentration of from about 5 to about 40 g/L sulphuric acid to cause dissolution of iron, formation of sulphuric acid and oxidation of substantially all oxidizable sulphide compounds to sulphate form with less than about 20% of oxidized sulphur being present as elemental sulphur during the oxidation step,

adding water to the oxidized slurry in a second repulping step to produce a repulped oxidized slurry with a pulp density in the range of from about 5 to about 15% by weight,

subjecting the repulped oxidized slurry to a second liquid-solids separation step to produce an acid and iron containing solution and oxidized separated solids,

recycling the acid and iron containing solution to at least one of the first and second repulping steps,

washing the oxidized separated solids with an aqueous wash solution in a washing step,

separating the washed solids from used washed solution containing acid and dissolved iron and non-ferrous metal sulphates in a third liquid-solids separation step,

recycling used washed solution containing acid, dissolved iron and dissolved non-ferrous metal sulphates to the acidic pretreatment step, and

recovering gold from the washed solids.

4,571,265

PROCESS FOR SEPARATION AND PURIFICATION OF PLATINUM GROUP METALS (II)

Karl-Heinz Konig, Frankfurt; Michael Schuster, Frankfurt-Harheim; Dieter Hollmann, Darmstadt, and Rainer Schlodder, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,892

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340056

Int. Cl.[4] C22B *11/04*

U.S. Cl. 75—108 20 Claims

1. In a process for the separation and purification of the platinum group metals from base metals from aqueous, acid solutions by precipitation with an organic material, separating and working up the precipitate, the improvement comprising employing as the precipitating agent a thiourea of the formula

$$R_1R_2N—CS—NH—CO—R_3$$

or

$$R_1R_2N—CS—NH—COOR_3$$

where R_1, and R_2, and R_3 are substituted or unsubstituted alkyl, aryl, or aralkyl groups at a pH below 4 and a temperature between 15° and 110° C.

4,571,266

PROCESS FOR SEPARATION AND PURIFICATION OF PLATINUM GROUP METALS (I)

Karl-Heinz König, Frankfurt; Michael Schuster, Frankfurt-Harheim; Gerd Schneeweis, Duren; Bernd Steinbrech, Frankfurt, and Rainer Schlodder, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,893

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3334055

The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.

Int. Cl.[4] C22B *11/04*

U.S. Cl. 75—108 15 Claims

1. In a process for the separation and purification of the platinum group metals from base metals and for separation of the platinum group metals from each other from aqueous, acid solutions by means of an organic extraction agent in a solvent non-miscible with water, the improvement comprising employing as the extraction agent a substituted thiourea of the formula

$$R_1R_2N—CS—NH—CO—R_3$$

or

$$R_1R_2N—CS—NH—COOR_3$$

where R_1, R_2, and R_3 are substituted or unsubstituted alkyl, aryl, or aralkyl groups.

4,571,267

ALCOHOL-SOLUBLE POLYAMIDES AND PRINTING INKS

Manfred Drawert, Froendenberg-Strickherdick, and Horst Krase, Hamm, both of Fed. Rep. of Germany, assignors to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,225

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243794

Int. Cl.[4] C09D *11/06;* C11C *3/00*

U.S. Cl. 106—27 10 Claims

1. A polyamide, alcohol soluble at room temperature, prepared by the condensation of an acid component comprising

(A) dimerized fatty acids having from 16 to 44 carbon atoms with

(B1) at least one aliphatic linear monocarboxylic acid having 3 to 6 carbon atoms, and

(B2) at least one aliphatic branched monocarboxylic acid having 4 to 9 carbon atoms, the equivalence ratio between components (A) and (B) ranging from 0.73:0.27 to 0.6:0.4, and each of the components (B1) and (B2) being present in an amount of at least 0.1 equivalent, based on unit total acid equivalent, and an amine component comprising

(C) ethylenediamine and

(D) hexamethylenediamine, the equivalence ratio between component (C) and (D) ranging from 0.7:0.3 to 0.4:0.6.

8. A printing ink comprising an alcohol solvent, a polyamide as in claim 1 as the binder, and a pigment or soluble dye.

4,571,268

SINGLE PACKAGE ZINC-RICH COATINGS

Laura M. Frain, Chicago, and Paul A. Petkus, Hickory Hills, both of Ill., assignors to The Sherwin Williams Company, Cleveland, Ohio

Filed Apr. 30, 1985, Ser. No. 728,988

Int. Cl.[4] C09D *5/10*

U.S. Cl. 106—1.17 10 Claims

1. A single package zinc-rich coating comprising by weight of the total composition from about 1.0 to 20% by weight of a partially hydrolyzed ethyl silicate, 1.0 to 50% by weight of at least one organic solvent, 30 to 75% by weight of zinc dust and a catalytic amount of an alkali metal nitrate selected from the group consisting of potassium nitrate, lithium nitrate, and sodium nitrate.

4,571,269

ASPHALT COMPOSITIONS

Jack N. Finch, and Janice S. Sprague, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 31, 1981, Ser. No. 249,546

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—273 R 12 Claims

1. An asphaltic composition which exhibits a negative test when subjected to Oliensis spot testing which consists of a mixture of:

(a) a bitumen or bituminous material that will not pass the Oliensis spot test by itself containing a small but effective amount sufficient to give passable bituminous material on Oliensis spot test of

(b) a calcium petroleum sulfonate in an effective amount in the range of about 2–5 weight percent.

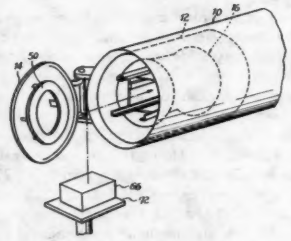
7. A method according to claim 6 wherein (c) is added to said tar sands and (c) comprises a mixture of monoesters or diesters prepared from polyisobutenyl-substituted succinic acid, its anhydride and monohydroxy or polyhydroxy phenols.

4,571,270

PROCESS AND AUTOCLAVE FOR DEWAXING MOLD FOR LOST WAX CASTING

Nobuyoshi Sasaki, Yokohama, Japan, assignor to M.C.L. Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1984, Ser. No. 603,108
Claims priority, application Japan, Apr. 27, 1983, 58-72974
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—5 4 Claims



1. A process for dewaxing a mold for use in lost wax casting, comprising the steps of securely loading said mold on a pallet, placing said pallet on a carrier rotatably assembled in a dewaxing tank, securely holding said pallet and said mold on said carrier while within said dewaxing tank by means operative responsive to a closing of a door on said dewaxing tank, rotating said carrier by about 180 degrees to invert said mold to an upside down position, charging superheated steam into said dewaxing tank to melt the wax after said dewaxing tank is closed, rotating said carrier by about 180 degrees to return said carrier to the initial condition, and releasing said pallet and said mold from said carrier responsive to an opening of said door to remove said mold from said dewaxing tank.

2. An autoclave for dewaxing a mold used for lost wax casting, comprising a dewaxing tank for containing high temperature steam, said tank having a door sealingly closing said tank, a carrier framework disposed within said dewaxing tank to be rotated about a substantially horizontal axis by at least about 180 degrees from a first position to a second inverted position, and a pallet for carrying thereon said mold, said carrier framework comprising a pair of opposing wheels rotatably supported by bearing means, drive means for rotating said pair of opposing wheels, guide rails extending between said opposing wheels for guiding and holding said pallet, and a perforated cover plate for fastening said mold to said pallet, a cooperative means operative responsive to closing and opening said door for securing said pallet and mold while in said tank and for releasing said pallet and mold for removal from said tank, and means for injecting superheated steam into said dewaxing tank, said pallet being assembled with and disassembled from said carrier framework when the latter is in said first position, and said carrier framework being arranged to rotate to said second inverted position while holding said pallet securely in the inverted condition during the dewaxing operation.

4,571,271

METHOD OF REMOVING SEDIMENT FROM A LARGE STORAGE CONTAINER

Gerald R. Dildine, 1112 Maple St., Collinsville, Okla. 74021

Filed Aug. 27, 1984, Ser. No. 644,456
Int. Cl.[4] B08B *5/04, 9/08*
U.S. Cl. 134—21 14 Claims

1. A method of cleaning the interior of a large storage container containing clean water that is subject to the accumulation of sediment that causes the water to be distasteful, discolorful, or contaminated; comprising:

(A) sanitizing the entire body and/or apparel of a cleaning person and a suction pump to remove the majority of viruses, germs, bacteria and dirt from the surface of his skin and/or apparel and pump;

(B) the sanitized cleaning person taking the suction pump and physically going underwater and slowly submerging into the interior of the container;

(C) the sanitized cleaning person turning on the suction pump before he reaches the bottom of the container;

(D) the sanitized cleaning person cleaning a spot on the bottom of the container with the suction pump before any part of his body disturbs the sediment;

(E) the cleaning person attaining footing on the clean spot; and

(F) the cleaning person removing the remainder of the sediment from the bottom of the container with the suction pump.

4,571,272

LIGHT METAL ALLOYS, PRODUCT AND METHOD OF FABRICATION

Roger Grimes, Gerrards Cross, England, assignor to Alcan International Limited, Montreal, Canada

Filed Aug. 26, 1983, Ser. No. 526,583
Claims priority, application United Kingdom, Aug. 27, 1982, 8224661
Int. Cl.[4] C21D *8/00*
U.S. Cl. 148—11.5 A 6 Claims

1. A method of superplastically forming an article from a light metal base alloy selected from:

(1) Li 1.5% to 4.0% by weight
Mg 0% to 5.0% by weight
Zr 0% to 0.4% by weight
Cu 0% to 6.0% by weight
Zn 0% to 5.0% by weight
Al remainder with normal impurities

(2) lithium containing magnesium alloys including 10.0% to 15.0% by weight of lithium and

(3) magnesium containing aluminium alloys including 6.0% to 12.0% by weight of magnesium

comprising cold working a first blank of the alloy to form a second blank having a modified crystal structure and forming the second blank into the article by hot working so that dynamic recrystallisation is induced therein and superplastic deformation occurs and so that as the dynamic recrystallisation continues the grain size is progressively refined.

4,571,273

PROCESS OF HEATING AND COOLING CHARGES IN BATCH-PROCESS INDUSTRIAL FURNACES

Peter Ebner, Leonding, Austria, assignor to Ebner-Industrieofenbau Ing. Josef Ebner KG, Leonding, Austria

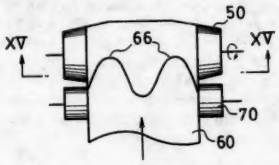
Filed Jun. 26, 1984, Ser. No. 624,590
Claims priority, application Austria, Jul. 5, 1983, 2457/83
Int. Cl.[4] C21D *1/76*
U.S. Cl. 148—16 5 Claims

1. In a batch-process of heating and subsequently cooling a charge in a bell-type annealing furnace during a heating period and a succeeding cooling period, wherein a protective gas is circulated through said furnace in contact with said charge during said heating and cooling periods, and wherein the improvement comprises changing the composition of said protective gas to decrease its specific gravity between the end of said heating period and the end of said cooling period by admixing a make-up protective gas having a lower specific gravity than the protective gas circulated through said furnace during said heating period to said circulated protective gas.

4,571,274
METHOD FOR CONTINUOUS ANNEALING OF A METAL STRIP

Fumiya Yanagishima; Toru Sasaki; Takaaki Hira; Hideo Abe, all of Chiba; Kouichi Tahara, Hyogo, and Yuji Shimoyama, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Continuation-in-part of Ser. No. 543,364, Oct. 19, 1983, abandoned. This application Sep. 11, 1984, Ser. No. 649,425
Claims priority, application Japan, Oct. 28, 1982, 57-188257; Dec. 19, 1983, 58-239523
Int. Cl.⁴ C21D *9/52*
U.S. Cl. 148—156 **4 Claims**



1. A method for continuously annealing a steel strip of a continuous length which comprises, in a process in which the steel strip is continuously passed through a vertical annealing furnace comprising a heating zone, and a soaking zone connected in series and the steel strip runs through these zones in this order, each of which zones is provided with two sets of hearth rolls each having an end-tapered or crowned configuration with the largest diameter DH in the upper and lower parts of the zone with the axes thereof being substantially in parallel with each other, the running steel strip being guided alternately by one of the upper hearth rolls and one of the lower hearth rolls,

providing at least one straightly cylindrical auxiliary roll having a diameter DA at a position where the auxiliary roll can be contacted with the running steel strip,

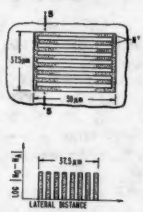
keeping the height difference LV between the axes of the hearth roll and the auxiliary roll not larger than 3.6 times of the DH, and

keeping the tension of the running steel strip at least 1.5 times as large as a critical tension in excess of which buckling takes place in the steel strip in the absence of the auxiliary roll.

4,571,275
METHOD FOR MINIMIZING AUTODOPING DURING EPITAXIAL DEPOSITION UTILIZING A GRADED PATTERN SUBCOLLECTOR

Tor W. Moksvold, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,927
Int. Cl.⁴ H01L *21/20, 21/74*
U.S. Cl. 148—175 **16 Claims**



1. Method for minimizing autodoping caused by a heavily doped buried layer embedded in a semiconductor substrate at a designated device region during epitaxial deposition including the steps of:

providing a semiconductor substrate of a first type of conductivity having a major surface;

forming buried regions on said surface according to a grated pattern by converting only partially the type of conductivity of the substrate in the area of said buried layer;

wherein said grated pattern leaves a portion of about 20% or more of said buried regions unconverted; and

growing an epitaxial layer over said surface;

wherein said regions merge into a single region to form a solid buried layer during said growing of an epitaxial layer and subsequent heating cycles.

4,571,276
METHOD FOR STRENGTHENING TERMINATIONS ON REDUCTION FIRED MULTILAYER CAPACITORS

James R. Akse, Canyon Country, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,597
Int. Cl.⁴ C03B *29/00*
U.S. Cl. 156—89 **11 Claims**

1. A method of producing base metal electrode multilayer capacitors having end terminations of increased strength, said method comprising the steps of:

(a) forming a body of a plurality of alternate layers of a reduction resistant ceramic dielectric material and electrode layers, said electrode layers consisting of a paste of a base metal selected from the group consisting of nickel, cobalt, iron and copper and alloys thereof, dispersed in a solution of an organic vehicle dissolved in an organic solvent, each of said electrode layers being sandwiched between layers of said ceramic dielectric material and having edges alternatively exposed at opposite faces of said body;

(b) firing said body first in air at low temperature to remove all organic residue, and then in an atmospheres reducing to the base metal of the electrode layer at a high temperature;

(c) applying to each face of said fired body having exposed electrode edges, end terminations consisting of a coating of a conductive paste comprising a noble metal and a reduction-resistant glass, in an amount of less than 15% by volume of the noble metal, dispersed in a solution of an organic vehicle in an organic solvent;

(d) heating said end terminations in air at a temperature of 300° C.–500° C. to remove all organic residue from said end terminations;

(e) heating said end terminations at a temperature of from 700° C.–950° C. in a reducing atmosphere having an oxygen partial pressure not in excess of that which is reducing for said electrode layers for a time sufficient to sinter the terminations to form adherent bonds between the glass of said terminations and said ceramic dielectric material, and to form adherent and electrically conductive bonds between the metal of said termination and said electrode layers;

(f) and then heating said end terminations for at least 15 minutes at a temperature of 375° C.–600° C. in an atmosphere in which the oxygen of partial pressure is at least equal to that of air thereby increasing the strength of said end terminations.

4,571,277
COLD RECAPPING METHOD FOR TIRES UTILIZING UNCURED RUBBER AND COMPRESSIBLE MOLD

Leon C. Goldstein, Atlanta, Ga., assignor to An-Rix, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 361,403, Mar. 24, 1982, Pat. No. 4,500,375. This application Aug. 26, 1982, Ser. No. 411,883
Int. Cl.⁴ B29D *30/54*; B29C *33/40*
U.S. Cl. 156—96 **8 Claims**

1. A cold tire recapping method utilizing uncured rubber and a prepared tire carcass comprising the steps of:

(a) selecting a male mold that has the desired design and transverse contour and diameter wanted for the recapped tread and selected sidewall portions of the tire when recapped and making an intermediate female mold therefrom,

(b) making a tread ring in the intermediate female mold,

(c) stretching the tread ring to greater than its normal diameter and making a final female mold thereon, and

(d) applying a layer of uncured rubber to the running surface of the prepared tire carcass and molding, curing and bonding the layer to the carcass in the final mold.

4,571,278

GLUE MOUNTING OF A GLASS IN A BAY

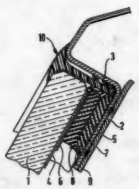
Heinz Kunert, Cologne, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Mar. 23, 1984, Ser. No. 592,893

Claims priority, application France, Mar. 31, 1983, 83 05328

Int. Cl.[4] B60J *1/00*

U.S. Cl. 156—108 **13 Claims**



1. A process for mounting a glass piece in a bay by gluing, comprising:

depositing a first bead of adhesive material on a portion of said glass piece to be inserted in said bay, and allowing said bead to harden;

superimposing on said hardened first bead a second bead of adhesive material capable of adhering to said first bead; and

pressing said glass piece into said bay and maintaining said glass piece in said position until said second bead hardens.

4,571,279

CONTINUOUS PROCESS FOR PRODUCING REINFORCED RESIN LAMINATES

Masayuki Oizumi; Masakazu Uekita, both of Kobe; Masana Goto, Miki; Ichiro Azumi, Ohtsu; Shoji Uozumi; Masaharu Abe, both of Kobe; Yasuo Fushiki, Takatsuki; Minoru Isshiki, Kobe, and Kunio Kawasaki, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 384,438, Jun. 2, 1982, Pat. No. 4,451,317, which is a division of Ser. No. 223,402, Jan. 8, 1981, Pat. No. 4,372,800. This application Nov. 28, 1983, Ser. No. 555,836

Claims priority, application Japan, Jan. 8, 1980, 55-1020

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.[4] B32B *31/00*; C09J *5/02*

U.S. Cl. 156—270 **1 Claim**

1. In a continuous process for producing a metal clad reinforced resin laminate comprising the steps of

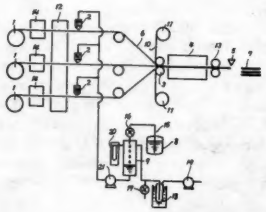
(a) impregnating a fibrous cellulosic substrate with a liquid unsaturated polyester resin which is free of volatile solvent and is capable of curing without generating liquid and gaseous by-products;

(b) laminating a plurality of the resin-impregnated substrates into a unitary member;

(c) sandwiching the laminate between a pair of covering sheets, at least one of which is a cladding metal foil capable of permanently bonding to the resin-impregnated substrates after the laminate is cured; and

(d) curing the laminate while supporting it between the pair of covering sheets without applying any appreciable pressure thereto; the improvement comprising:

(e) pre-impregnating the cellulosic substrate with a solution of (i) an N-methylol compound having an unsaturated bond capable of copolymerizing with a vinyl monomer, or (ii) an N-methylol compound lacking such a copolymerizable bond in admixture with a modifying agent having both a group capable of condensing or adding to the N-methylol compound and an unsaturated bond copolymerizable with a vinyl monomer, and then drying the pre-impregnated substrate;



(f) impregnating the substrate from step (e) to a final resin content of 10–90% by weight, based on the total weight of the resin-impregnated substrate;

(g) partially curing the sandwiched laminate in step (d) at an elevated temperature until the metal foil is firmly bonded in position and the entire structure is sufficiently hard and self-supporting to be cut into lengths with a guillotine cutter or movable slicer;

(h) cutting a continuous length of the partially cured laminate into a predetermined length;

(i) fully curing the cut length of said laminate at an elevated temperature to decrease warp and residual strain in the laminate; and

(j) mechanically correcting any distortion in the configuration of the fully cured laminate by geometrically modifying the warp in two directions which are perpendicular to each other to form a finished product which is substantially flat, free of residual strain or internal stress, and resistant to changes in physical and electrical properties upon exposure to elevated temperatures.

4,571,280

METHOD FOR INCREASING THE ADHESION OF POLYDIORGANOSILOXANE-POLYCARBONATE BLOCK COPOLYMER INTERLAYERS TO ADJOINING LAMINAE AND PRIMER COMPOSITION TO ACCOMPLISH SAME

Donald G. LeGrand, Burnt Hills, and William V. Olszewski, Stillwater, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Aug. 13, 1984, Ser. No. 639,710

Int. Cl.[4] C09J *5/00*

U.S. Cl. 156—329 **2 Claims**

1. A method for increasing the adhesion of a polydiorganosiloxane-polycarbonate block copolymer lamina or layer to a polycarbonate lamina or layer comprising the steps of:

(a) applying to at least one side of said polycarbonate lamina or layer a primer composition comprising a solution of a polydiorganosiloxane-polycarbonate block copolymer in

an organic solvent comprising a $C_{(3-6)}$ alkanol mixed with either a $C_{(1-6)}$ halogenated alkyl or a $C_{(6-9)}$ halogenated phenyl;

(b) evaporating said solvent;

(c) laying-up said polydiorganosiloxane-polycarbonate block copolymer lamina or layer relative to said coated face of said polycarbonate lamina or layer; and

(d) bonding said laid-up laminae or layers to produce a multi-ply composite or laminate.

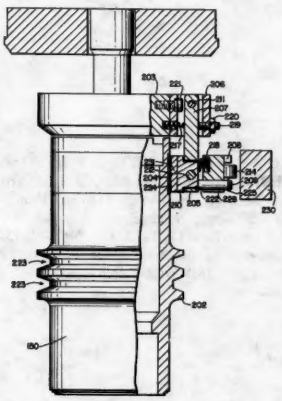
4,571,281
BRAKING APPARATUS FOR SPINWELDING MACHINERY

Donald MacLaughlin, Midland, Mich., and Vincent E. Fortuna, Huntington Beach, Calif., assignors to Cosden Technology, Inc., Dallas, Tex.

Continuation of Ser. No. 337,450, Jan. 6, 1982, abandoned. This application Jan. 2, 1985, Ser. No. 686,637

Int. Cl.[4] B23K *27/00*; B32B *31/00*

U.S. Cl. 156—580 **16 Claims**



1. A brake device for periodically braking a rotating spindle of a multi-spindle spinwelder, comprising:

(a) a brake arm pivotingly supported at one end on a stationary member of said spinwelder adjacent an axial end of said spindle, said brake arm being arranged to extend substantially axially parallel to said spindle;

(b) a brake shoe means pivotingly supported by said brake arm at another end thereof, positioned opposite said rotating spindle;

(c) a cam follower means resiliently supported in a rest position spaced from said brake shoe means;

(d) a rotating generally annular timing cam coaxially surrounding said spindle outside of and adjacent said cam follower and having a radially inwardly projecting portion for periodically engaging said cam follower means to move said cam follower means from said rest position to engage said brake shoe means and to apply a braking force against said rotating spindle to periodically arrest the rotation of said spindle.

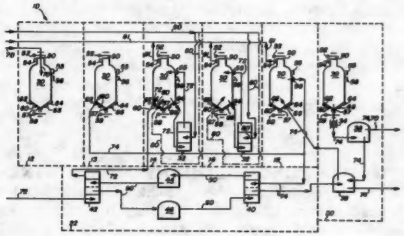
4,571,282
PROCESS AND APPARATUS FOR BATCH DIGESTER FLUID HEAT RECLAMATION

Charles B. Almond, and James S. Leonard, both of Birmingham, Ala., assignors to Baker International Corporation, Orange, Calif.

Filed May 4, 1984, Ser. No. 607,345

Int. Cl.[4] D21C *11/06*

U.S. Cl. 162—47 **6 Claims**



1. An improved heat recovery method in which digestible material is placed in a pressurized batch digester with a cooking liquor and cooked under pressure to create a spent liquor, the improvement comprising:

passing the pressurized spent liquor directly from the digester through a first portion of a first fluid-to-fluid heat exchanger;

passing an inert heat exchange fluid through a second portion of said first heat exchanger while simultaneously passing the pressurized spent liquor through the first heat exchanger to heat the heat exchange fluid with the sensible heat of said pressurized spent liquor without vapor generation;

passing said pressurized spent cooking liquor into a holding tank;

passing said heated inert heat exchange fluid through a first portion of a second fluid-to-fluid heat exchanger;

passing the cooking liquor through a second portion of the second heat exchanger simultaneously with passage of the heated heat exchange fluid through the second heat exchanger to cool the heated heat exchange fluid while heating the cooking liquor to create a quantity of preheated cooking liquor;

conveying the cooled heat exchange fluid to the first heat exchanger; and

conveying the preheated cooking liquor into the digester.

4,571,283
REVERSIBLE SLICE LIP

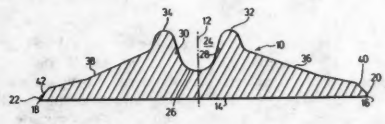
Erich Rebas, Pierrefonds, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada

Filed Nov. 2, 1984, Ser. No. 667,584

Claims priority, application Canada, Dec. 2, 1983, 442482

Int. Cl.[4] D21F *1/06*

U.S. Cl. 162—344 **4 Claims**



1. In a headbox of a paper making machine, a slice lip, said slice lip having a longitudinal centerline and a bottom surface, a first slice edge formed by a junction defined by the intersection of one longitudinal side edge with said bottom surface, said first slice edge being in operative position defining one side of a slice opening from said headbox, a second slice edge spaced from, and substantially parallel to said first slice edge,

said second slice edge being formed by a junction defined by the intersection of a second longitudinal side edge with said bottom surface, said first and second longitudinal side edges being substantially parallel to said longitudinal centerline, and at least those portions of said bottom surface adjacent said junction of said one and said second longitudinal side edges being in a common plane, means for mounting said slice lip on said headbox, said slice lip being substantially symmetrical on opposite sides of said longitudinal centerline, said means for mounting including mounting means provided on the surface of said slice lip opposite from said bottom surface and spaced from and located between said first and said second slice edges, whereby said means for mounting said slice lip may be released and said slice lip turned end for end and said second slice edge positioned to define said one side of said slice opening.

4,571,284

DEHYDRATING 2,6-DIMETHYLMORPHOLINE

Wolfgang H. E. Müller; Werner Böxkes, both of Marl, and Heinz Scholten, Haltern, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,405

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342009

Int. Cl.[4] B01D *3/10;* **C07D** *265/30*

U.S. Cl. 203—14 **9 Claims**

1. In the process for dehydrating 2,6-dimethylmorpholine by rectification the improvement comprising separating a mixture consisting essentially of water and said 2,6-dimethylmorpholine by rectification at a pressure between 6 and 150 mbars at the column head and recovering said 2,6-dimethylmorpholine having a water content less than 500 parts per million as a product from the sump.

4,571,285

OXYGEN SENSOR FOR AND METHOD OF DETERMINING CONCENTRATION OF OXYGEN

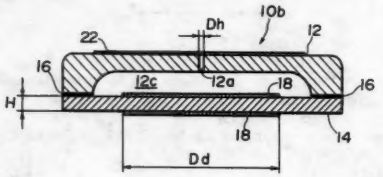
Mitsuhiro Nakazawa, Sakura; Hiroshi Osanai, Tokyo; Yoshiya Isono, Funabashi; Akiyoshi Asada, Tokyo, and Hitoshi Ohira, Sakura, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 24, 1985, Ser. No. 738,150

Claims priority, application Japan, May 29, 1984, 59-108945; Jul. 25, 1984, 59-153038

Int. Cl.[4] G01N *27/56*

U.S. Cl. 204—1 T **6 Claims**



1. An oxygen sensor for determining the partial pressure of oxygen in a monitored gas environment which comprises a diffusion housing of zirconia based material having a gas diffusion aperture, an oxygen ion conductive plate of zirconia based material, a pair of electrode layers mounted on opposite sides of said conductive plate, and a sealing glass material sealingly bonding said conductive plate at one side to said housing to provide a diffusion chamber defined by said diffusion housing and said conductive plate, said electrodes being connectable to a power source for being supplied with an electric potential to pump oxygen ion out of said diffusion chamber through said conductive plate to flow a current through said electrodes which current is indicative of the partial pressure of the oxygen in the monitored gas environment, and said sealing glass material containing SiO_2, BaO, Na_2O and ZrO_2.

6. A method of determining the partial pressure of oxygen in a monitored gas environment which comprises the steps of:

(a) providing an oxygen sensor which comprises a diffusion housing of zirconia based material having a gas diffusion aperture, an oxygen ion conductive plate of zirconia based material, a pair of electrode layers mounted on opposite sides of said conductive plate, heating means mounted on said housing, and a sealing glass material sealingly bonding said conductive plate at one side to said housing to provide a diffusion chamber defined by said diffusion housing and said conductive plate, said electrodes being connectable to a power source for being supplied with an electric potential to pump oxygen ion out of said diffusion chamber through said conductive plate to flow a current through said electrodes which current is indicative of the partial pressure of the oxygen in the monitored gas environment, said sealing glass material containing SiO_2, BaO, Na_2O and ZrO_2, each of said oxygen ion conductive plate having a thickness of 0.08 to 0.8 mm, each of said electrode layers having a circular shape and a diameter of not more than 7 mm, and said gas diffusion aperture having a length of 1 mm and a diameter of 10 to 50 μm; and

(b) operating said heating means to maintain said oxygen sensor at temperatures of about 350° C. to about 450° C. and operating said oxygen sensor to determine the partial pressure of the oxygen in the monitored gas environment.

4,571,286

PROCESS FOR SELECTIVELY DEPOSITING A REFRACTORY METAL LAYER ON A GRAPHITE PIECE

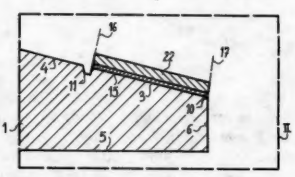
Jean-Marie Penato, Les Essart Le Roi, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 11, 1983, Ser. No. 540,557

Claims priority, application France, Oct. 29, 1982, 82 18246

Int. Cl.[4] C25D *5/02, 5/10;* **B05D** *1/32, 5/12*

U.S. Cl. 204—15 **8 Claims**



1. A process for selectively depositing a tungsten or tantalum refractory metal layer on a graphite piece, comprising masking selected surfaces of said graphite piece with a masking material to establish graphite surfaces which exhibit poor adhesion to said metal, depositing only on selected unmasked surfaces of said graphite piece an intermediate layer of a coating material which promotes strong adhesion between said unmasked surfaces and an outer layer of said refractory metal, removing said masking material from said selected surfaces to form corresponding unmasked surfaces, depositing said refractory metal over both of the formerly masked surfaces and the thus coated unmasked surfaces, and removing from said formerly masked surfaces the refractory metal poorly adhered thereto.

4,571,287
ELECTROLYTICALLY PRODUCING ANODIC OXIDATION COAT ON AL OR AL ALLOY

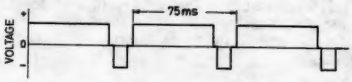
Keigo Okubo, Shiojiri; Shoji Toba, Matsumoto, and Tokuo Kumagai, Suwa, all of Japan, assignors to Nagano Prefecture, Nagano and Kabushiki Kaisha Chiyoda, Tokyo, both of, Japan

Continuation-in-part of Ser. No. 308,099, Oct. 2, 1981, abandoned. This application Feb. 24, 1984, Ser. No. 582,148

Claims priority, application Japan, Dec. 27, 1980, 55-184995; Dec. 27, 1980, 55-184996

Int. Cl.[4] C25D *11/14, 11/22*

U.S. Cl. 204—37.6 **7 Claims**



1. A method for enhancing the naturally developed color of an anodic oxidation coating on the surface of an Al alloy material having at least one alloying element which forms a color compound in the presence of a sulfur compound during electrochemical production of said oxidation coating, the method comprising the steps of:

(a) electrochemically oxidizing the surface of the Al alloy material to form an oxide coating by performing a first step of electrolysis in a sulfuric acid-containing electrolyte utilizing an alternately reversed current having a reversed period each cycle of less than 50 percent and more than about 5 percent in said electrolyte, and

(b) enhancing the color of the coating by performing a second step of electrolysis within said electrolyte by means of an alternately reversed current having a longer reversed period each cycle than that utilized in step (a), said first and second stages being conducted with a current having a frequency of between about 13.3 Hz to about 200 Hz and with a rest period preceding and following tthe reversed period of each cycle.

4,571,288
PROCESS FOR THE ELECTROLYSIS OF AQUEOUS ALKALI METAL CHLORIDE SOLUTION

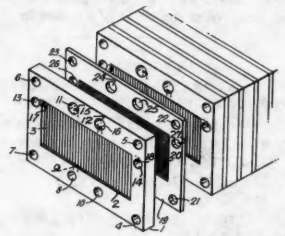
Thomas W. Boulton, Frodsham, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Nov. 7, 1984, Ser. No. 669,633

Claims priority, application United Kingdom, Nov. 14, 1983, 8330322

Int. Cl.[4] C25B *1/16, 1/46*

U.S. Cl. 204—98 **29 Claims**



1. A process for the electrolysis of an electrolyte in an electrolytic cell comprising a plurality of anodes and cathodes, a separator positioned between each of the adjacent anodes and cathodes to form in the cell a plurality of anode compartments and cathode compartments, the process comprising charging the electrolyte to the anode compartments, electrolyzing the electrolyte, and removing the products of electrolysis from the anode and cathode compartments, the improvement which comprises effecting the electrolysis in an electrolytic cell in which the anodes and cathodes each comprise an electro-conducting electrocatalytically-active portion affixed to a frame member of an electrically non-conducting plastics material, and in which the frame members are bonded directly or indirectly to each other.

4,571,289
PHOTOCHEMICAL PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS

Colin G. Griggs, Ashford, England, assignor to The British Petroleum Company, p.l.c., London, England

Filed Dec. 13, 1984, Ser. No. 681,006

Claims priority, application United Kingdom, Dec. 30, 1983, 8334611

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.9 **10 Claims**

1. A process for the production of an alkylene glycol from formaldehyde and either methanol or a secondary alcohol which process comprises reacting the formaldehyde with the methanol or the secondary alcohol in the presence of an organic peroxide having the formula R—O—O—R^1 wherein R and R^1 are independently either alkyl or aralkyl groups containing from 3 to 12 carbon atoms characterised in that the reaction is carried out in the presence of electromagnetic radiation capable of decomposing the organic peroxide.

4,571,290
PROCESS FOR THE SELECTIVE OXIDATION OF OLEFINS WITH PHOTOCHEMICAL ILLUMINATION OF SEMICONDUCTOR POWDER SUSPENSIONS

Michael D. Ward, South Euclid; James F. Brazdil, Jr., Mayfield Village, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Aug. 22, 1984, Ser. No. 643,149

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.69 **32 Claims**

1. A process for the selective oxidation of olefins comprising the steps of:

forming a suspension of a semiconductor powder in a solvent media, said semiconductor powder having the general formula $A_xB_yC_z$ where A is selected from Bi, Sn, Pt, Pd, Cu, Fe, W, V, Sb, Mo, Ru or Ag and mixtures thereof; B is Te or W and mixtures thereof; C is O or S; x equals 0 to 5; y equals 1 to 3; and z is a number necessary to satisfy the other elements;

adding an olefin to said suspension in the presence of an oxidant to form a mixture; and

photochemically activating said mixture with illumination having an energy at least equal to the band gap of said semiconductor powder wherein the selectivity is controlled by the selection of A, of said solvent and of said oxidant.

4,571,291
APPARATUS FOR THE ELECTRODEPOSITION OF METAL

James E. Schell, deceased, late of Long Beach, Calif. (by Ellen C. Schell, administrator); Stephen G. Lucas, Shell Beach, Calif.; Dale A. Neff, La Crescenta, Calif., and Bonnie E. Tuggle, Pleasanton, Calif., assignors to Alumatec, Inc., Grover City, Calif.

Filed Aug. 20, 1984, Ser. No. 642,506

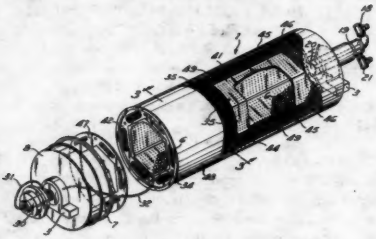
Int. Cl.[4] C25D *17/20*

U.S. Cl. 204—213 **8 Claims**

1. An improved apparatus for the electrodeposition of aluminum from aprotic, organoaluminum electrolytes which are free from water and oxygen, the apparatus being of the type having a treatment barrel which can be sealed airtight and can be rotated horizontally and vertically about support means, a drive means for imparting rotational movement to said support

means, an inlet means for introducing gases and liquids to said barrel, an outlet means for delivering same from the barrel, and anode and cathode means associated with said barrel for passing a current through an electrolyte in said barrel, the improvement wherein:

(a) the treatment barrel is formed with three concentric, relatively closely-spaced chambers, the radially-innermost chamber being enclosed by a perforated non-conducting



plating drum adapted to contain the workpieces to be plated, and connected to the negative side of the electric circuit so as to render said workpieces cathodic;

(b) a radially middle chamber defined by enclosure within a mesh metal screen connected to the positive side of the electric circuit so as to render said middle chamber anodic; and

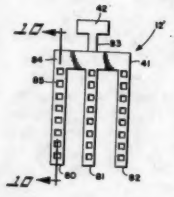
(c) a radially outermost chamber formed by the outer metal shell of the treatment barrel.

4,571,292

APPARATUS FOR ELECTROCHEMICAL MEASUREMENTS

Chung-Chiun Liu, and Vasilios A. Karagounis, both of Cleveland Heights, Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Aug. 12, 1982, Ser. No. 407,566
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—412 **32 Claims**



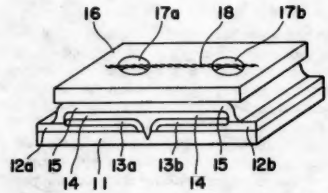
1. A sensor system for measuring the concentration of an electrochemically active species in an electrolyte, comprising a substrate; a working electrode supported by said substrate; a reference electrode supported by said substrate; a counter electrode supported by said substrate, at least one of said electrodes being formed by thick film or thin film techniques as a layer of electrically conductive material on said substrate; a layer of electrically insulating material on at least a portion of said layer of electrically conductive material, said layer of electrically insulating material having discontinuities to expose individual plural electrode portions; electrical means for providing energy to said electrodes, said electrical means including means for applying voltage potentials to said electrodes and feedback means for controlling the voltage between said reference and counter electrodes thereby to maintain a constant voltage across said working and reference electrodes, such that balanced but reverse ionization reactions of such species respectively occur at said workiing and counter electrodes while essentially no reaction occurs at said reference electrode; and current measuring means for measuring current flow between said working and counter electrodes as a representation of the concentration of such species.

4,571,293

ION SELECTIVE ELECTRODE AND METHOD OF PREPARATION THEREOF

Osamu Seshimoto, and Mitsuharu Nirasawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 9, 1985, Ser. No. 732,367
Claims priority, application Japan, May 10, 1984, 59-93775; Jun. 20, 1984, 59-128239
Int. Cl.[4] G01N *27/30*; B05D *5/12*
U.S. Cl. 204—418 **10 Claims**



1. An integral ion selective electrode for analysis of sodium ion comprising the following layers in order, a support, an electroconductive metal layer, a layer of a water-insoluble salt of said metal, an electrolyte layer which comprises an electrolyte salt of a sodium ion with the same anion as the anion of the water-insoluble salt, said electrolyte layer being substantially free from a binder, and an ion selective layer, wherein the electrolyte layer comprises crystalline electrolyte having a mean crystal size of not more than 8 μm.

6. A process for the preparation of an integral ion selective electrode for analysis of sodium ion comprising the following layers in order, a support, an electroconductive metal layer, a layer of a water-insoluble salt of said metal, an electrolyte layer which comprises an electrolyte salt of a sodium ion with the same anion as the anion of the water-insoluble salt, said electrolyte layer being substantially free from a binder, and an ion selective layer, wherein the electrolyte layer is formed by coating an aqueous solution of said electrolyte salt on the layer of a water-insoluble salt and drying the thus coated layer by bringing it in contact with a stream of gas maintained at a temperature of not lower than 40° C., thereby producing a layer of of crystalline electrolyte having a mean crystal size of not more than 8 μm over the layer of a water-insoluble salt.

4,571,294

PROCESS FOR EXTRACTING HYDROCARBONS FROM HYDROCARBON BEARING ORES

Robert H. Friedman, and Bertram E. Eakin, both of Houston, Tex., assignors to Getty Oil Company, Houston, Tex.

Filed Jul. 2, 1984, Ser. No. 627,188
Int. Cl.[4] C10G *1/04*
U.S. Cl. 208—11 LE **34 Claims**

1. A process for recovering hydrocarbons from a diatomite ore comprising the steps of:

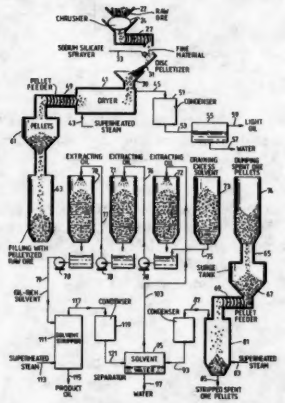
reducing the size of the ore to less than about 5 mesh to form a reduced ore;

combining the reduced ore with liquid to form ore pellets;

treating the ore pellets to form extractable ore pellets, said extractable ore pellets having sufficient consistency so as to be substantially insoluble in an extracting solvent capable of dissolving hydrocarbons from the hydrocarbon bearing ore and so minimize the release of fines from the pellets, and said extractable pellets being of sufficient size,

surface area and moisture content so as to facilitate extraction of the hydrocarbons from a bed of the extractable pellets upon contact of the extractable pellets with the extracting solvent;

contacting a bed of the extractable pellets with extracting solvent in an extraction zone such that the relative velocity of the solvent to the extractable pellets is at least about one-half gallon per square foot per minute or more to



thereby extract hydrocarbons from the extractable pellets and form spent pellets and a hydrocarbon rich solvent stream comprising extracting solvent and extracted hydrocarbons, said extracted hydrocarbons having an ash content of about less than 3 weight percent; and

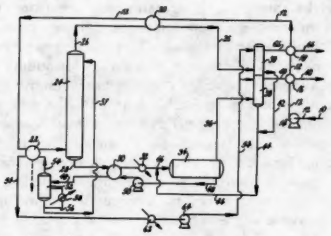
recovering extracting solvent from the spent pellets while retaining the spent pellets in pellet form without release of a significant amount of fines.

4,571,295

AROMATIC/NONAROMATIC SEPARATIONS

Paulino Forte, Yonkers, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 13, 1983, Ser. No. 494,438
Int. Cl.[4] C10G *21/16*
U.S. Cl. 208—334 **25 Claims**



1. The process for the dearomatization of a mixed hydrocarbon feed which comprises the following steps:

(a) contacting said feed in an extraction zone at a temperature of at least about 150° C. with at least one extraction solvent consisting essentially of an extraction solvent selected from the group consisting of hexylene glycol and glycol ethers of the formula:

$$R_4O—[CHR_5—(CHR_6—)_x—O]_y—R_7$$

wherein R_4, R_5, R_6 and R_7 are hydrogen or alkyl or araalkyl having 1 to about 10 carbon atoms with the provision that R_4 and R_7 may not both be hydrogen, x has a value of 3 or 5 and y has a value of 3 or 5 with the proviso that such extraction solvent may contain up to less than 10 percent by weight of an anti-solvent;

(b) forming a solvent phase containing aromatic hydrocarbons and a raffinate phase containing nonaromatic hydrocarbons;

(c) cooling said solvent phase;

(d) introducing said cooled solvent phase to a separation zone and introducing therewith an effective amount of an anti-solvent for said aromatic hydrocarbons in said extraction solvent to provide an extract phase containing aromatic hydrocarbons and a solvent phase containing extraction solvent and anti-solvent;

(e) adjusting the anti-solvent in said solvent phase to less than about 10 percent by weight and recycling said solvent phase to the extraction zone of step (a); and

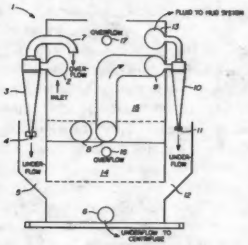
(f) recovering the extract phase of step (d) and the raffinate phase of step (a).

4,571,296

TWO STAGE DESILTER

W. Gerald Lott, Houston, Tex., assignor to Flo Trend Systems, Inc., Houston, Tex.

Filed Aug. 15, 1984, Ser. No. 640,962
Int. Cl.[4] B04C *5/24*
U.S. Cl. 209—211 **5 Claims**



1. In drilling mud desilting apparatus the combination of an integrated and transportable separator unit, comprising:

(a) a first-stage mud inlet manifold, a second-stage inlet manifold, and a mud outlet manifold all mounted together as part of a separator body;

(b) a second-stage inlet reservoir mounted as part of said separator body and connected to provide drilling mud into said second-stage inlet manifold;

(c) a solids collection reservoir mounted as part of said separator body;

(d) a plurality of first-stage hydrocyclones mounted as part of said separator body and respectively connected and adapted to

(1) receive mud from said first-stage inlet manifold,

(2) separate first size solids from said mud,

(3) discharge the mud separate[d] from said first size solids into said second-stage inlet reservoir, and

(4) discharge said first size solids into said solids collection reservoir; and

(e) a plurality of second-stage hydrocyclones mounted as part of said separator body and respectively connected and adapted to

(1) receive mud from said second-stage inlet manifold,

(2) separate smaller second size solids from said mud,

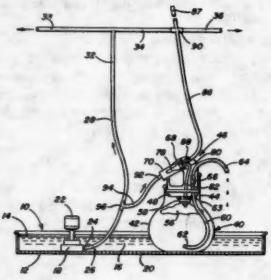
(3) discharge the mud separated from said smaller second size solids into said mud outlet manifold for reuse, and

(4) discharge said second size solids into said solids collection reservoir.

4,571,297
BLADDER PUMP

Jerold D. Jenkins, 850 Vindicator Dr., Suite B 212, Colorado Springs, Colo. 80919

Filed Dec. 26, 1984, Ser. No. 686,733
Int. Cl.[4] C02F 5/00
U.S. Cl. 210—101 6 Claims



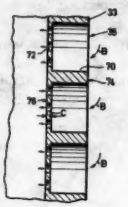
1. In combination, a liquid flow system including a reservoir, an intermittently operable pump including an outlet having the inlet end of a pressure delivery line connected thereto and an inlet for receiving liquid from said reservoir, a repeating cyclic liquid dispensing system including a first hollow container of a given volume of liquid and fluid pressure actuatable dispensing means operatively associated with said container and said pressure delivery line operative to automatically dispense a predetermined fractional amount only of said given volume of liquid from said first container into said reservoir in response to each operation of said pump for at least a predetermined minimum time period and the resultant discharge pressure of liquid in said delivery line throughout said minimum time period, said dispensing means including a hollow collapsible bladder disposed in said first container for displacing liquid from within said first container in response to an equal amount of liquid being pumped into said bladder, said dispensing means further including a closed second hollow container having a second hollow collapsible bladder disposed therein and a flow line communicating the interior of said second bladder with said delivery line for receiving liquid from said delivery line by gravity upon termination of operation of said pump, said flow line having one-way check valve means operatively associated therewith, a discharge line having opposite ends communicated with the interiors of said bladders, and a gravity flow return line having opposite ends communicated with said pressure delivery line and the interior of said second container exteriorly of said second bladder, said second container being elevated above said reservoir.

4,571,298
SORTING SCREEN

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik GmbH & Co., Reutlingen, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,439
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336874
Int. Cl.[4] B01D 29/04, 29/20
U.S. Cl. 210—498 7 Claims

1. A pressure sorter for fibre suspensions comprising a screen wall which is closed to form an annular sorting screen basket having an inflow side and a flow-off side, said basket having cylindrically shaped recesses arranged on the inflow side of the screen wall and narrower sorting apertures on the flow-off side, said apertures opening into said recesses and said recesses each extending over a plurality of sorting apertures and being spaced in all directions from one another such that the screen

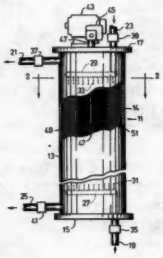


wall has a net structure on said inflow side between said recesses, wherein said sorting apertures are designed as bores.

4,571,299
CONTINUOUS EXTRACTION APPARATUS

Salvatore J. Silvis, Staten Island, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 21, 1983, Ser. No. 515,773
Int. Cl.[4] B01D 11/04
U.S. Cl. 210—511 3 Claims



1. An improved, continuous, unbaffled, extraction apparatus, useful for extracting extractable material from a liquid or particulate feed material with an extracting liquid which is immiscible with the feed material and is in a different phase, which comprises: a hollow, vertical, cylindrical column; first inlet means in an upper or lower part of the column for adding to the column a liquid or particulate feed material containing an extractable material to be extracted therefrom; first outlet means for removing from the other such part of the column a raffinate of the feed material of a reduced content of the material to be extracted; second inlet means for adding to the part of the column from which the raffinate is removed an extracting liquid which is immiscible with and of a different density from both the feed material and the raffinate, being heavier or lighter than both; second outlet means for removing such extracting liquid, with extracted material therein, from the part of the column in which the feed liquid is added; and movable contact promoting means in the column comprising a vertical shaft coaxial with the column which is rotationally oscillatable, means for oscillating said shaft and a contacting member of a mesh, woven or filamentary structure with openings therein representing at least 60% of the area of said structure, said contacting member being held to and extending from the shaft to near the inner wall of said column and being a single member wrapped about said shaft on a series of concentric circles, said contact promoting means imparting substantially only rotationally oscillating horizontal motion to the immiscible phases with a minimum of undesirable axial mixing in the extraction zone of the column.

4,571,300
PROCESS FOR REDUCING THE BOUND WATER CONTENT OF COAL

Richard A. Schraufnagel, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

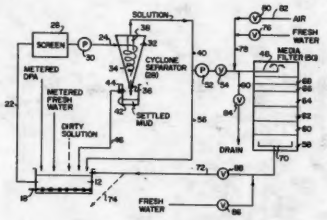
Filed Aug. 7, 1984, Ser. No. 638,833
Int. Cl.[4] F26B *3/00*; C02F *1/72*
U.S. Cl. 210—761 11 Claims

1. In a de-watering process for reducing the water content of coal containing bound water by releasing at least a portion of said bound water, said process consisting essentially of treating said coal in a de-watering zone at a temperature from about 150° C. to about 350° C. in the presence of liquid water at a pressure sufficient to maintain a portion of said water in a liquid phase for a treatment time sufficient to release at lesat a portion of said bound water and discharging a liquid water stream containing at least a portion of said released bound water from said de-watering zone, an improvement comprising injecting a free oxygen-containing gas into at least a portion of said liquid water in said de-watering zone at a temperature sufficient to initiate oxidation of organic materials in said liquid water and in an amount sufficient to oxidize a desired quantity of said organic materials by a wet air oxidation process.

4,571,301
METHOD AND APPARATUS FOR CLEANING CHEMICAL/WATER SOLUTIONS

Eugene L. Inskeep, Jr., 20320 - 14th Ave. West, Lynnwood, Wash. 98036

Filed Sep. 19, 1984, Ser. No. 652,749
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—788 18 Claims



1. In a system in which a chemical/water solution is used in a way resulting in high and low density particulate impurities entering into the solution, a method of cleaning the solution for reuse, comprising:

collecting the used solution in a reservoir;

pumping used solution from the reservoir into the inlet of a cyclone separator;

directing a primary solution flow out from an upper first outlet of the cyclone separator to and through a media filter, for removal of low density particles from the solution;

removing high density particles from the solution in the cyclone separator, out from a lower second outlet of the cyclone separator;

removing cleaned solution from the media filter;

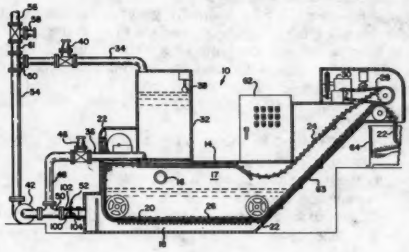
reusing the cleaned solution; and

pumping used solution from the reservoir to the inlet of the cyclone separator at a first flow rate, pumping primary solution flow from the first outlet of the cyclone separator into the media filter at a second flow rate which is lower than the flow rate of the primary solution out from the first outlet of the cyclone separator, resulting in only a portion of the primary solution flow from the cyclone separator being directed into the media filter, and directing the remaining portion of the primary solution flow back into the reservoir.

4,571,302
RELIEVING PRESSURE DIFFERENTIAL IN VACUUM FILTER

David H. Willson, Farmington Hills, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 570,818, Jan. 16, 1984, abandoned. This application Dec. 31, 1984, Ser. No. 687,975
Int. Cl.[4] B01D *29/36*, *29/42*
U.S. Cl. 210—791 6 Claims



1. In a filter system for removing suspended matter from a liquid and recirculating clean filtered liquid to an industrial machine for reuse wherein the system includes a tank separated by a movable filter media into an inlet compartment and a filtrate compartment and a pump connected to withdraw filtered liquid from the filtrate compartment at a rate sufficient to create a pressure differential between the inlet and filtrate compartments, and a reservoir of filtered liquid connectable to supply filtered liquid to both said pump and said filtrate compartment upon the pressure differential reaching a selected level, the improvement comprising: a check valve located in a conduit extending between said filtrate compartment and said pump, said check valve being operative to close when the pressure differential reaches said selected level and liquid is supplied from said reservoir whereby to prevent excessive flow of said liquid into said filtrate compartment; and a fluid passage means in said check valve permitting controlled liquid flow from said reservoir to said filtrate compartment when said check valve is closed whereby to reduce said pressure differential and allow movement of the filter media.

4,571,303
BUILT NONIONIC DETERGENT COMPOSITION CONTAINING STABILIZED POLYETHYLENE TEREPHTHALATE-POLYOXYETHYLENE TEREPHTHALATE SOIL RELEASE PROMOTING POLYMER

Loretta K. Ciallella, Colonia, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 23, 1985, Ser. No. 693,705
Int. Cl.[4] C11D *3/37*
U.S. Cl. 252—174.23 15 Claims

1. A particulate soil release promoting built synthetic organic nonionic detergent composition comprising a detersive proportion of nonionic detergent, a building proportion of alkaline builder for such nonionic detergent, a soil release promoting proportion of soil release promoting block copolymer of polyethylene terephthalate (PET) and polyoxyethylene terephthalate (POET), and a stabilizing proportion of water soluble alkali metal polyacrylate (APA), which stabilizes the PET - POET polymer against deterioration and loss of soil release properties on storage in contact with alkaline materials, such PET - POET and APA polymers being in intimate contact in solid particles, and the other components of the detergent composition being in particulate form.

4,571,304

NOVEL POLYESTER POLYOLS AND MIXTURES MADE THEREFROM

Robert P. Yeater, Moundsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Division of Ser. No. 520,665, Aug. 5, 1983, Pat. No. 4,525,575.
This application Mar. 15, 1985, Ser. No. 712,054
Int. Cl.[4] C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182 5 Claims

1. A blend comprising

(a) a member selected from the group consisting of 1,4-butanediol, ethylene glycol, and mixtures thereof, and

(b) a polyester polyol having an hydroxyl number of from about 25 to about 130 and an acid number of 2 or less produced by reacting

(i) from about 40 to about 60 parts by weight of adipic acid,

(ii) from about 1 to about 20 parts by weight of ethylene glycol,

(iii) from about 1 to about 30 parts by weight of 1,4-butanediol, and

(iv) from about 5 to about 50 parts by weight of a polyoxyethylene glycol having a molecular weight of from 106 to 680,

the total parts of (i), (ii), (iii), and (iv) being 100, the weight ratio of component (b) to component (a) being from 16:1 to 7:3.

4,571,305

PROCESS FOR THE PREPARATION OF RARE EARTH OXYHALIDE PHOSPHOR

Jacob G. Rabatin, Montville, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 483,335, Apr. 8, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,324
Int. Cl.[4] C09K *11/475*
U.S. Cl. 252—301.4 H 2 Claims

1. A process for the preparation of lanthanum and gadolinium oxyhalide phosphor crystals selected from the group consisting of oxychlorides and oxybromides activated with thulium ion consisting essentially of recrystallized phosphor crystals with retarded crystal growth in the fastest crystal growth direction comprising the following steps:

(a) heating mixtures of particles of oxides selected from lanthanum and gadolinium oxides, including mixtures thereof, which further contains thulium ion in activator amounts from about 0.005 to 0.01 mole per mole of the phosphor and an ammonium halide whose halide ion is that of the selected oxyhalide, along with sufficient yttrium ion to produce an yttrium level in said phosphor from about 0.005 to 0.2 mole per mole of the phosphor for a time and temperature sufficient to form the selected oxyhalide phosphor, and

(b) reheating the resultant oxyhalide phosphor mixture with an alkali metal halide flux mixture whose halide ions are that of the selected oxyhalide phosphor to a temperature not exceeding approximately 900° C. for a time sufficient to recrystallize said selected oxyhalide phosphor and produce phosphor crystals with greater thickness and polyhedral shape having an average median particle size up to 9.0 microns diameter said phosphor crystals having a smaller average median particle size than the phoshor crystals prepared as above absent yttrium.

4,571,306

SEPARATION OF LIPOPHILIC COMPONENTS FROM SOLUTIONS BY ADSORPTION

William G. Kozak, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 26, 1984, Ser. No. 604,795
Int. Cl.[4] B01D *15/08*; B01F *17/56*; C07G *3/00*
U.S. Cl. 252—351 18 Claims

1. A method for removing lipophilic residues from a surfactant composition comprised of surfactant molecules, lipophilic residue molecules of a molecular dimension less than the surfactant molecules and an effective amount of a liquid carrier to permit the adsorption of said lipophilic molecules from said surfactant composition with a hydrophobic adsorbent, said liquid carrier being either a non-polar organic solvent having a minimum molecular dimension greater than the maximum pore dimension of said hydrophobic adsorbent or a polar solvent having lower affinity for adsorption by said hydrophobic adsorbent than said lipophilic residue and said method comprising:

(A) contacting said surfactant composition with a solid hydrophobic adsorbent characterized as having a maximum pore dimension sufficiently small to effectively preclude molecular adsorption of the surfactant molecules, said maximum pore dimension being less than 15 angstroms in size;

(B) selectively adsorbing at least a portion of said lipophilic molecules from said surfactant composition; and

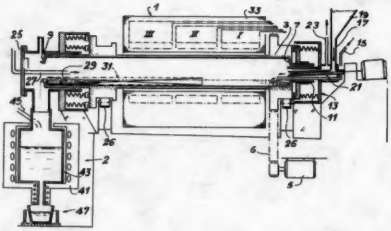
(C) partitioning the adsorbent containing the adsorbed lipophilic molecules from the surfactant composition to provide a surfactant composition of a reduced lipophilic residue content.

4,571,307

PROCESS FOR CONDITIONING RADIOACTIVE WASTE

Roger Bonniaud, Goudargues; Antoine Jouan, Bagnols sur Ceze, and Yves Héry, Orange, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 19, 1983, Ser. No. 563,307
Claims priority, application France, Dec. 23, 1982, 82 21665
Int. Cl.[4] G21F *9/16*
U.S. Cl. 252—628 13 Claims



1. A process for the conditioning of waste constituted by radioactive metal particles insoluble in nitric acid solutions, comprising the steps of suspending said particles in a liquid, subjecting the suspension to an evaporation heat treatment by injecting the suspension onto a hot bed of a powder of a metal or an alloy selected from the group consisting of copper, nickel, zinc, copper alloys, nickel alloys, zinc alloys and stainless steel, to form a dry mixture of powder said and metal particles and melting said dry mixture at a temperature sufficient to melt the metal or alloy powder and to form clearly defined compounds between the metal of the powder and at least part of the metal constituents of the radioactive particles.

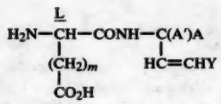
4,571,308

L-AMINODICARBOXYLIC ACID AMINOALKENOIC ACID ESTER AMIDES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 6, 1985, Ser. No. 730,970
Int. Cl.[4] C07C *103/52*
U.S. Cl. 260—112.5 R 27 Claims

1. A compound represented by the formula:



wherein

A is CO_2R in which R is alkyl containing 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $—(CHR_2)_n—R_1$ or $—CHR_3R_4$;

R_1 is alkyl-substituted cycloalkyl, cycloalkenyl, bicycloalkyl or bicycloalkenyl containing at least one alkyl in the β-position of the ring, up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0, or 1; and

m=0 or 1;

and food-acceptable salts thereof.

4,571,309

C_{22}-CYCLOALIPHATIC TRICARBOXYLIC ACID DERIVED ISETHIONATE ESTERS AND METHOD OF PREPARATION

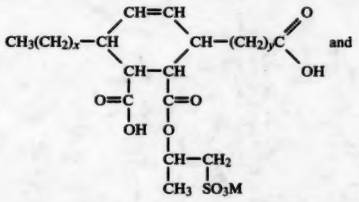
Curtis S. Lege, Ladson, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,212

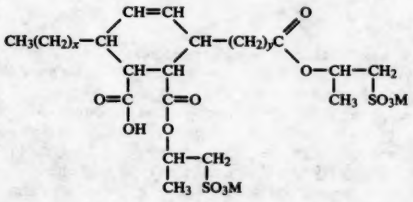
Int. Cl.[4] C07C *143/90*; C11D *1/28*

U.S. Cl. 260—400 **12 Claims**

1. An anionic emulsifier comprising at least one compound of the group selected from the following formulae:

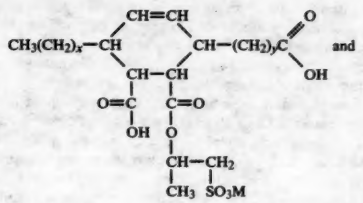


and

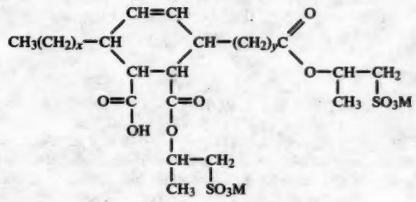


where x and y are integers from 3 to 9, and x and y together equal 12, and M is a cation selected from the group consisting of alkali metals, alkaline earth metals, ammonium or substituted ammonium.

4. An emulsifiable concentrate formulation for agricultural chemical delivery systems comprising an agricultural chemical, a solvent and, from 5% to 10% of an oil-soluble, anionic emulsifier comprising at least one compound selected from the group consisting of the following formulae:

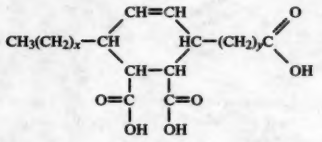


and



where x and y are integers from 3 to 9, and x and y together equal 12, and M is a cation selected from the group consisting of alkaline earth metals, the alkali metals K^+, Rb^+ and Cs^+, ammonium and substituted ammonium.

5. In a process for preparing an isethionate ester which comprises reacting an isethionate alcohol with a fatty acid, the improvement comprising reacting ammonium or substituted ammonium methyl isethionate alcohol with C_{22}-cycloaliphatic tricarboxylic acid of the formula



where x and y are integers from 3 to 9, and x and y together equal 12, said reaction producing an intermediate formation of anhydrides of the ring carboxyls of said C_{22}-cycloaliphatic tricarboxylic acid and said reaction further comprising the steps of

(a) heating said C_{22}-cycloaliphatic tricarboxylic acid and xylene to produce reflux in an inert atmosphere,

(b) adding a stoichiometric amount of said ammonium or substituted ammonium methyl isethionate alcohol, based on said C_{22}-cycloaliphatic tricarboxylic acid, at a controlled rate over 0.25 to 0.75 hour, and

(c) continuing the reaction under reflux conditions for up to 12 hours.

4,571,310

PROCESS FOR PREPARING ALKOXYPHOSPHONITRILE COMPOUNDS

Hiroshi Tanino, Hasuda; Tetsuhiko Okamoto, Tokyo; Shinichiro Ueyama, Tokyo, and Kazuhiko Fuzikawa, Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Japan

Filed May 23, 1984, Ser. No. 613,284

Claims priority, application Japan, May 26, 1983, 58-91453

Int. Cl.[4] C07F *9/24*

U.S. Cl. 260—973 **3 Claims**

1. A process for preparing alkoxyphosphonitrile compounds using phosphonitrile chloride oligomer and alcohol as raw materials, which comprises

(a) a first step wherein phosphonitrile chloride oligomer is reacted with alcohol of an amount of 0.2 to 0.8 equivalent

per 1 equivalent of active chlorine atoms contained in said phosphonitrile chloride oligomer, in the presence of organic tertiary amine of an amount of not less than the equivalent to said alcohol at a temperature below 20° C., to substitute about 34 to 75 percent of said active chlorine atoms with alkoxy groups,

(b) a second step wherein temperature is elevated to cause condensation through liberation of alkyl chloride, and

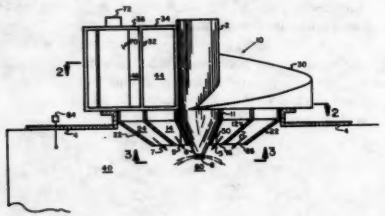
(c) a third step wherein alcohol of an amount of not less than the equivalent to the active chlorine atoms remaining at the time of termination of the second step is added to reaction system to cause reaction thereby to substitute said remaining active chlorine atoms with alkoxy groups substantially perfectly, the reaction being carried out in the presence of an inactive organic solvent.

4,571,311

APPARATUS FOR INTRODUCING A PROCESS GAS INTO A TREATMENT CHAMBER

William B. Ferguson, Jr., Harpersville; Gerald E. Bresowar, Homewood, and Louis B. Wheeler, Birmingham, all of Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 22, 1985, Ser. No. 693,406
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—64 B **4 Claims**



1. In combination with a treatment chamber having a liquid-gas contact zone surrounding a liquid spray apparatus disposed to spray a treatment liquid into said treatment chamber, an apparatus for introducing a process gas into said liquid-gas contact zone comprising:

a. an open-ended inner shell supporting the liquid spray apparatus in a position with the spray means of the liquid spray apparatus extending through an open end of said said inner shell into the treatment chamber;

b. a first gas inlet duct disposed centrally about said inner shell supporting the liquid spray apparatus and defining an inner annular conduit having an annular outlet opening into the treatment chamber about the liquid spray apparatus;

c. a second gas inlet duct disposed concentrically about and spaced radially from said first gas inlet duct and defining an outer annular conduit having an annular outlet opening into the treatment chamber about said first gas inlet duct;

d. a horizontal spiral gas supply duct disposed about said liquid spray apparatus and having an inlet opening for receiving the process gas and an outlet opening mating with said first and second gas inlet ducts;

e. partition means disposed vertically within said horizontal spiral gas supply duct and extending across said horizontal spiral gas supply duct so as to divide said horizontal spiral gas supply duct into a first and a second horizontal spiral gas supply sub-duct disposed in side-by-side relationship, the first gas supply sub-duct mating with and opening to said first gas inlet duct to form therewith an inner flow passageway for directing a first portion of process gas into the treatment chamber, and the second gas supply sub-duct mating with and opening to said second gas inlet duct to form therewith an outer flow passageway for directing a second portion of process gas into the treatment chamber;

f. damper means disposed in the second gas supply sub-duct at the inlet thereto for controlling the flow of process gas through the second gas supply sub-duct, said damper means being selectively positionable across the second gas supply sub-duct so as to regulate the cross-sectional flow area at the inlet of the outer flow passageway defined by the second gas supply sub-duct and the second gas inlet duct; and

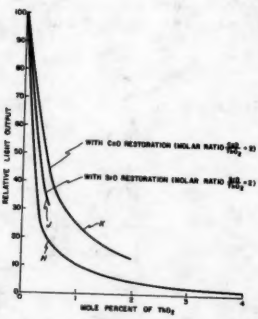
g. a plurality of vane means mounted to said inner shell at spaced intervals about the circumference thereof, each of said vane means disposed generally vertically and extending outwardly from said inner shell into the inner annular conduit.

4,571,312

PREPARATION OF YTTRIA-GADOLINIA CERAMIC SCINTILLATORS BY SINTERING AND GAS HOT ISOSTATIC PRESSING

Charles D. Greskovich; Dominic A. Cusano, both of Schenectady, N.Y., and Frank A. DeBianca, Chapel Hill, N.C., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 389,814, Jun. 18, 1982, abandoned. This application May 7, 1984, Ser. No. 607,993
Int. Cl.[4] C04B *35/50*
U.S. Cl. 264—1.2 **24 Claims**



1. A method for preparing a transparent-to-translucent polycrystalline ceramic x-ray or gamma ray scintillator body comprising the steps of:

preparing a multicomponent powder consisting essentially of Y_2O_3, Gd_2O_3, at least one rare earth activator oxide selected from the group consisting of Eu_2O_3, Nd_2O_3, Yb_2O_3, Dy_2O_3, Tb_2O_3, and Pr_2O_3, at least one transparency promoter selected from the group consisting of ThO_2, ZrO_2, and Ta_2O_5, and at least one light output restorer selected from the group consisting of CaO and SrO;

pressing said multicomponent powder to form a powder compact;

sintering said powder compact to the closed porosity stage; and

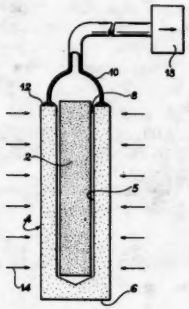
gas hot isostatically pressing the sintered compact with an inert gas to yield a transparent-to-translucent polycrystalline ceramic scintillator body.

4,571,313

PROCESS FOR THE PRODUCTION OF PLASTIC OPTICAL FIBERS

Louis R. Allemand, Limours; Jean Calvet, Paris; Jean-Claude Cavan, Vincennes; Maurice Goldwasser, Antony, and Jean-Claude Thevenin, Velizy-Villacourblay, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 2, 1984, Ser. No. 606,244
Claims priority, application France, May 3, 1983, 83 07348
Int. Cl.[4] B29D *11/00*; G02B *6/02*
U.S. Cl. 264—1.5 8 Claims



1. A process for the production of plastic optical fibres, comprising the following successive stages:

(a) forming a sheath in the form of a solid cylinder with at least one cylindrical recess, and at least one cylindrical rod constituting the core of the fibres, said rod having a smaller diameter than that of the recess,

(b) introduction of the cylindrical rod into the recess and placing under a vacuum the gap defined between the rod and the cylinder,

(c) raising the temperature in order to soften the cylinder and to engage it against the rod, while maintaining said vacuum to create a pressure differential resulting from said vacuum, and

(d) drawing the thus obtained preform.

4,571,314

PROCESS FOR PRODUCING SUBSTRATE FOR OPTICAL RECORDING MEDIUM

Setsuo Suzuki, Yokohama; Koji Morishita, Zushi, and Yushi Sakamoto, Yokohama, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 23, 1984, Ser. No. 664,018
Claims priority, application Japan, Jul. 4, 1984, 59-137250
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.7 7 Claims

1. A process for producing an optical recording medium, comprising an epoxy resin substrate having hard coating layers formed on both sides thereof, which process comprises:

(i) the step of coating and drying a solution containing a radiation-curable resin composition on one side of each of two glass plates having surface flatness and subjecting the coating films to radiation to cure them,

(ii) the step of arranging the two glass plates having the cured coating films so that the coating films face each other, and sealing three sides of the two glass plates with a spacer to form a liquid-casting mold having a cavity;

(iii) the step of casting into the cavity of the mold an epoxy resin composition comprising an alicyclic epoxy resin or a mixture of an alicyclic epoxy resin and an aromatic epoxy resin, an organic polybasic acid anhydride, a curing accelerator, and an anti-discoloring agent, and heat-curing the epoxy resin composition to integrate it with the coating films and provide a three-layer transparent optical recording medium within the mold, and

(iv) the step of recovering the integrated transparent three-layer product from the mold to effect release between the glass faces and the coating films and to transfer the coating films to both sides of the cured epoxy resin substrate.

4,571,315

PREPARING CERAMIC MATERIAL PELLETS

Panaiotis Gerontopoulos, Leghorn; Guido Cogliati, Rome, both of Italy, and Karl Richter, Karlsruhe, Fed. Rep. of Germany, assignors to AGIP Nucleare S.p.A. and CNEN-Comitato Nazionale per l'Energia Nucleare, both of Rome, Italy

Continuation of Ser. No. 438,745, Nov. 3, 1982, abandoned, which is a continuation of Ser. No. 133,598, Mar. 24, 1980, abandoned, which is a continuation of Ser. No. 033,319, Apr. 25, 1979, abandoned. This application Feb. 7, 1984, Ser. No. 577,828
Claims priority, application Italy, May 5, 1978, 23059 A/78
Int. Cl.[4] C04B *35/34*
U.S. Cl. 264—0.5 22 Claims

1. In a method for preparing pellets of a ceramic material selected from the oxides of iron, zirconium, titanium, nickel, chromium silicon, aluminum, rare earths and mixtures thereof, and comprising the steps of:

(a) converting an aqueous solution containing said material in the form of its metal salt and a gelling agent into gel particles by adding solution to a precipitation medium;

(b) thermally conditioning said particles; and

(c) cold pelletizing and sintering said thermally conditioned particles at a temperature of from about 1100° C. to about 1750° C.;

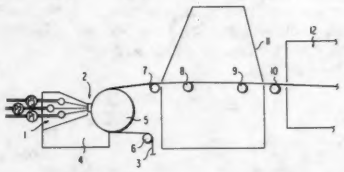
the improvement which comprises thermally conditioning said particles in a controlled atmosphere of air at a temperature between 400° C. to 600° C.

4,571,316

METHODS OF FORMING MULTILAYER COATED FILM

Yasuhito Naruse, and Yuzo Inukai, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 12, 1984, Ser. No. 599,360
Claims priority, application Japan, Apr. 12, 1983, 58-64034
Int. Cl.[4] B29C *35/08*
U.S. Cl. 264—22 3 Claims



1. A method of forming a nonaqueous multilayer coated film comprising applying two or more nonaqueous layers to a continuously traveling flexible web, wherein at least one of the two or more coated layers comprises a coating composition containing an electron beam hardenable resin, and at least one of the two or more coated layers has a viscosity of about 100 cps or more, and irradiating the two or more coated layers with electron beams to harden the coated layers or increase the viscosity thereof, and thereafter drying the coated layers.

4,571,317
PROCESS FOR PRODUCING BINDERLESS CARBON OR GRAPHITE ARTICLES

George K. Layden, Jr., Glastonbury; Romeo G. Bourdeau, South Windsor, and Roscoe A. Pike, Simsbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 661,211, Feb. 25, 1976, abandoned, which is a continuation of Ser. No. 481,438, Jun. 20, 1974, abandoned. This application Aug. 23, 1984, Ser. No. 643,109
Int. Cl.[4] B32B *7/02*
U.S. Cl. 264—29.1 6 Claims

1. A process for producing binderless, single phase bulk carbon or graphite articles having a fibrillar microstructure comprising the steps of:

assembling a plurality of thermally stable, organic polymer fibers into a unidirectional pattern, said fibers being selected from the group consisting of (1) acrylonitrile polymers including the homopolymers and copolymers, terpolymers and graft polymers containing at least 50 percent acrylonitrile, (2) aromatic polycyclic polymers (3) polyvinyl alcohol, (4) polyvinyl chloride, (5) polymethyl vinylketone (6) coal tar and (7) pitch;

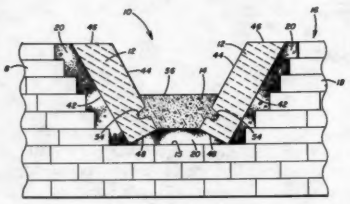
consolidating said assembled fibers by subjecting them simultaneously to a temperature and pressure sufficient to cause heat distortion flow and self-bonding of contiguous fibers, said temperature being in the range of 100°–500° C. and said pressure being in the range of 15–4,000 psi (0.103–27.5 MPa); and

pyrolizing said fibers to carbon or graphite in a non-oxidizing atmosphere at a temperature of 650° C.–3500° C. to produce an article with a Young's modulus of at least 2.5×10^7 psi (172 GPa).

4,571,318
METHOD OF CONSTRUCTING REFRACTORY RUNNER

Harry R. Dudro, Jr., Pittsburgh, Pa., and Frank E. Morris, Portsmouth, Ohio, assignors to BMI, Inc., Pittsburgh, Pa.

Division of Ser. No. 380,216, May 20, 1982, Pat. No. 4,478,395. This application Jun. 20, 1984, Ser. No. 622,480
Int. Cl.[4] F27D *1/16*
U.S. Cl. 264—30 5 Claims



1. A method of constructing a refractory runner comprising the steps of,

positioning a pair of refractory side blocks in substantially upstanding, spaced apart relation,

laying a base of particulate refractory material between the side blocks,

inserting particulate refractory material of the base in keyways provided in each of the side blocks,

compacting the particulate refractory material to a preselected thickness to form a continuous uninterrupted surface between the pair of side blocks,

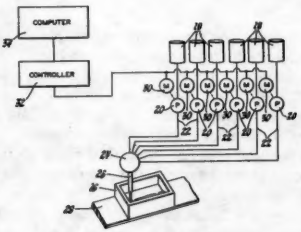
compacting the particulate refractory material in the keyways to interlock the side blocks with the base, and

thereby forming a trough having opposed upstanding side walls formed by the pair of side blocks joined by a floor formed by the particulate refractory material.

4,571,319
METHOD AND APPARATUS FOR PRODUCING POLYMER ARTICLES HAVING DIFFERENT PROPERTIES IN DIFFERENT REGIONS OF THE ARTICLES

Donald T. Baluch, Troy, and Paton M. Zimmerman, Jr., Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1984, Ser. No. 596,945
Int. Cl.[4] B29C *67/22, 39/12, 39/44*
U.S. Cl. 264—40.1 8 Claims



1. The method of producing a molded polymer article having different properties in different regions of the article comprising the steps of

delivering several streams of hardenable fluid precursor constituents at first predetermined rates to a mixing head for combining in a first mixture and discharge into a portion of a mold cavity corresponding to a first article region, the mixture being suitable to yield a polymer with a first property, and then

changing the relative rates of the streams of constituents and delivering several streams of fluid constituents at second predetermined rates to the mixing head to obtain a second mixture discharging into another portion of the mold cavity corresponding to a second article region, the second mixture being suitable to yield a polymer with a second property,

whereby the regions of the molded article containing the first mixture will have the first property and the regions containing the second mixture will have the second property.

4,571,320
METHOD AND APPARATUS FOR LOADING AND UNLOADING SHEET MOLDING COMPOUND IN AND FROM A PRESS

James D. Walker, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1984, Ser. No. 667,169
Int. Cl.[4] B29C *7/00*
U.S. Cl. 264—40.1 4 Claims

1. A method of using a robot to load and unload precut

pieces of sheet molding compound and the like between an upper die and a lower die of a sheet molding press comprising the steps of:

having the robot ready and hold a raw piece while the press is closed and molding a piece already therein,

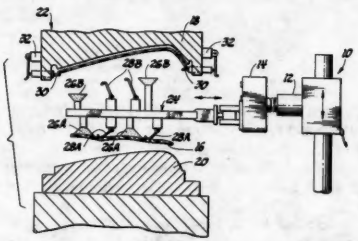
opening the press on completion of molding the piece therein and suspending such molded piece independent of the robot in a predetermined intermediate position between the dies as the press opens, provided such molded piece does not stick to the upper die,

having the robot enter the raw piece into the press between the molded piece and the lower die,

having the robot sense the presence of the molded piece in the suspended position and in that event secure same thereto, and if not so present and stuck in the upper die then withdraw the raw piece from the press, and

having the robot with the securing thereto of the molded piece only then unload the raw piece on the lower die and retract the molded piece from between the dies for subsequent press molding of the thus loaded raw piece.

3. Apparatus for using a robot to load and unload precut pieces of sheet molding compound and the like between an



upper die and a lower die of a sheet molding press characterized by:

end effector means for readying and holding a raw piece on the robot while the press is closed and molding a piece already therein,

suspender means for suspending such molded piece independent of the robot in a predetermined intermediate position between the dies as the press opens, provided such molded piece does not stick to the upper die,

means for causing the end effector means to enter the raw piece into the press between the molded piece and the lower die,

means on said end effector means for selectively sensing the presence of the molded piece in the suspended position and in that event to secure the molded piece to said effector means and, if not so present and stuck in the upper die then withdraw the raw piece from the press, and

means for causing the end effector means with the securing thereto of the molded piece to only then unload the raw piece on the lower die and retract the molded piece from between the dies for subsequent press molding of the thus loaded raw piece.

4,571,321

METHOD AND APPARATUS FOR LEVELING A BATCH OF PULVERULENT CONSTITUENTS IN MAKING A VITREOUS CELLULAR MATERIAL

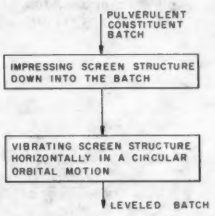
John Kijowski, Bradford, and Gregory D. Miller, Port Allegany, both of Pa., assignors to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1983, Ser. No. 566,520
Int. Cl.[4] B28B *1/08*; C04B *38/00*
U.S. Cl. 264—43 **10 Claims**

1. A method for leveling a batch of pulverulent constituents in a process for making a vitreous cellular material comprising the steps of,

impressing a screen structure having at least one substantially flat screen layer down into and through at least a portion of said batch of pulverulent constituents, and

vibrating said screen structure in a circular orbital motion in a substantially horizontal plane while impressing said


PULVERULENT CONSTITUENT BATCH
IMPRESSING SCREEN STRUCTURE DOWN INTO THE BATCH
VIBRATING SCREEN STRUCTURE HORIZONTALLY IN A CIRCULAR ORBITAL MOTION
LEVELED BATCH

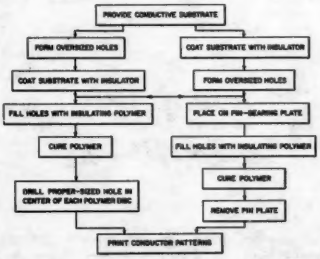
screen structure down into and through at least a portion of said batch of pulverulent constituents to promote substantially uniform compaction and distribution of said constituents within said batch.

4,571,322

METHOD FOR PROVIDING INSULATED HOLES IN CONDUCTING SUBSTRATE

Charles W. Eichelberger, Schenectady; Robert J. Wojnarowski, Ballston Lake, and Abraham Auerbach, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 445,125, Nov. 29, 1982. This application Jul. 5, 1985, Ser. No. 751,926
Int. Cl.[4] B29C *39/12*
U.S. Cl. 264—154 **8 Claims**



1. A method for providing at least one insulated hole, of a first size, in a substrate of a conductive material, comprising the steps of:

(a) providing the substrate of a desired conductive material;

(b) forming an aperture, of a size greater than the first size, through the substrate in each location at which one of the at least one holes is to be located;

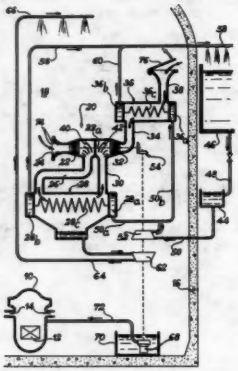
(c) filling each aperture with a mass of an insulating material; and

(d) forming the first-sized hole through each associated insulating material mass to leave an insulating material sleeve between the hole and the conductive substrate.

4,571,323
COOLING DEVICE

Didier Costes, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 4, 1982, Ser. No. 385,253
Claims priority, application France, Jun. 9, 1981, 81 11309
Int. Cl.[4] G21C *15/18*
U.S. Cl. 376—282 9 Claims

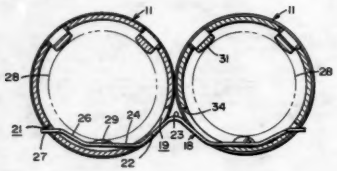


1. In a pressurized water nuclear reactor comprising a confinement enclosure and a primary circuit located in said enclosure, a confinement enclosure cooling device comprising in series a turbine supplied by hot, humid air contained in the enclosure, a condenser in which the air from the turbine is dried and cooled by thermal contact with an external cooling fluid, and a compressor actuated by the turbine, and which returns the dried air into the enclosure.

4,571,324
NUCLEAR FUEL ASSEMBLY SPACER

Eric B. Johansson, and Bruce Matzner, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Sep. 26, 1983, Ser. No. 535,851
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—441 8 Claims

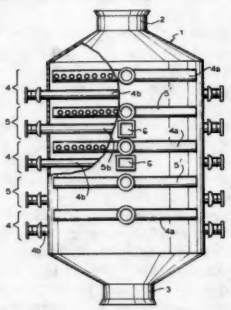


1. In a fuel assembly for a nuclear reactor including a plurality of elongated elements, a spacer for retaining said elements in lateral position comprising: an array of laterally positioned, cojoined tubular ferrules, each of said ferrules providing a passage for one of said elements; laterally oriented leaf spring members, each of said spring members spanning two adjacent ones of said ferrules and extending therein to engage and laterally support the elements extending through said adjacent ferrules, facing sides of said adjacent ferrules being formed with cutouts to receive and support the spring member, the sides of said ferrules opposite said facing sides being formed with openings to receive and restrain the ends of said spring member, said spring member being formed with a generally V-shaped central portion with an apex extending toward the adjacent sides of said adjacent ferrules whereby in the absence of elements through said adjacent ferrules said central portion contacts said adjacent sides to provide a preload on said spring member and limit the amount of projection of said spring member into said ferrules whereby the insertion of said elements through said ferrules is facilitated, said central portion of said spring member being unrestrained in the presence of said elements through said ferrules, said spring member having left and right arms extending outward from said V-shaped central portion, each of said arms including a relatively long center portion for contacting a respective one of said elements, a shorter end portion angled toward said ferrules and a tab of reduced height at the end of each arm engaging a respective one of said openings whereby the resulting shoulders at the ends of said spring member engage the inner surface of said ferrules adjacent said openings to laterally locate and retain said spring member.

4,571,325
REACTOR FOR CONDUCTING HIGH EXOTHERMIC AND ENDOTHERMIC CATALYTIC PROCESSES

Valentin A. Nikolov, Ruse; Dimiter G. Klissurski, Sofia, and Boyan M. Jurov, Ruse, all of Bulgaria, assignors to Stopanski chimitcheski Kombinat "Gavril Genov", Russe, Ruse, Bulgaria

Filed Jul. 2, 1984, Ser. No. 626,625
Claims priority, application Bulgaria, Jul. 1, 1983, 61567
Int. Cl.[4] B01J *1/00, 8/04, 10/00*; C10G *34/00*
U.S. Cl. 422—191 6 Claims



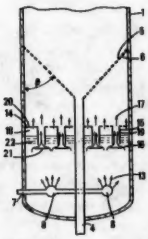
1. A reactor for conducting highly exothermic and endothermic catalytic processes, said reactor comprising a vertical shell provided with an upper inlet port for receiving raw materials and a lower outlet port for discharging product therefrom, a plurality of regions therein which extend perpendicular to, and are axially spaced along, the vertical axis of said shell, each said region being formed of a plurality of tube means, said regions constituting alternating contact regions and heat exchange regions with adjacent contact regions being separated by a heat exchange region, each tube means of a contact region being coated on the outer surface thereof with a catalyst and each tube means of a heat-exchange region being devoid of such a catalyst coating, means operatively connected to all of said tube means for providing flow a heat-exchange medium therethrough and said shell being provided with at least one lateral port disposed between each pair of adjacent contact regions.

4,571,326

PROCESS AND DEVICE FOR HYDROCONVERSION OF HYDROCARBONS

Didier Bischoff; Gérard Courteheuse, both of Rueil Malmaison, and Pierre Renard, Saint Nom la Breteche, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 4, 1983, Ser. No. 539,029
Claims priority, application France, Oct. 4, 1982, 82 16597
Int. Cl.[4] B01J 8/08; F28D 21/00
U.S. Cl. 422—207 4 Claims



1. An apparatus for conducting a process for withdrawing solid particles and introducing a fluid charge at the lower portion of a contact zone, comprising a reactor, first introducing means for introducing fresh catalyst at the upper part of the reactor, first discharge means for discharging used catalyst at the lower part of said reactor, with said first discharge means comprising at least one withdrawing funnel of inverted conical pyramidal shape, whose apex is turned downwardly, with the apex further defining an opening for discharging used catalyst from the reactor,

wherein said at least one withdrawing funnel is provided with perforations or slots substantially distributed over its entire surface, with the size of said perofrations being sufficiently small to prevent passage of catalyst particles introduced into the reactor through said perforations, but sufficiently large to permit passage of an ascending stream of fluid charge;

second introducing means for introducing a fluid at the lower part of the reactor and second discharge means for discharging a treated fluid charge at the upper part of the reactor; and

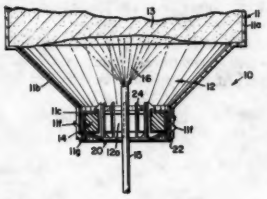
distribution means arranged between the funnel and the fluid second introducing means, said distribution means comprising (α) grid means having perforations which are sufficiently small to prevent the passage of the major part of a liquid phase of fluid introduced and permitting only passage of the major part of a gaseous phase of fluid introduced; (β) a plurality of continuous and substantially vertical walls or barriers defining a plurality of conduits extending downwardly from said grid means and having their lower ends arranged in the reactor at a level generally higher than that of the second fluid introducing means (7) and (8), said barriers or walls thus defining compartments below said grid means and surrounding said conduits; and (γ) plates or baffles (21) arranged below the lower ends of the conduits for ensuring accumulation of introduced fluid in said compartments.

4,571,327

SOLID CAST DETERGENT DISPENSER WITH INSERT FOR HOLDING NONCOMPATIBLE CHEMICAL

Spencer B. Larson, Newport; Richard H. Johnson, West St. Paul; Thomas L. Hennemann, Jr., Woodbury, and James L. Copeland, Burnsville, all of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Mar. 22, 1984, Ser. No. 592,604
The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.
Int. Cl.[4] B01D 11/02
U.S. Cl. 422—263 8 Claims



1. A dispenser for a detergent, comprising:

(a) a housing defining an inner cavity, said housing having a funnel section leading downwardly to a collar at a lower end thereof and having a circular opening, a body of liquid soluble detergent located within said inner cavity and positioned above and spaced apart from said collar;

(b) a liquid soluable insert, located within said collar, of a substance not chemically compatible with the detergent, said insert having an inner opening;

(c) means for retaining said insert in said circular opening, said retaining means having an aperture; and

(d) spray-forming nozzle means mounted to extend into said cavity through said circular opening, said aperture and said inner opening, whereby a pressurized spray of liquid is directed towards the detergent, such that hydraulic action of said nozzle directed spray dissolves a portion of the detergent, and forms a detergent solution which passes by gravity over said insert and dissolves a portion of said insert, and whereby the detergent solution and dissolved insert are discharged out of said circular opening through said aperture.

8. A dispenser for a detergent, comprising:

(a) a housing defining an inner cavity, said housing having a funnel section leading downwardly to a collar at a lower end thereof and having a circular opening, a body of liquid soluble detergent located within said inner cavity and positioned above and spaced apart from said collar;

(b) a liquid soluable insert, located within said collar, of a substance not chemically compatible with the detergent, said insert having an inner opening;

(c) means for retaining said insert in said circular opening of said inner cavity, said retaining means comprising:

(i) a retaining ring, said ring engages said opening and supports said insert in said opening, said ring defining an inner aperture;

(ii) a plurality of generally upwardly extending resilient fingers cooperatively connected to said retaining ring and proximate said inner aperture;

(iii) a cover having an inner aperture cooperatively connected to and secured by said fingers, wherein said insert is placed over said fingers and said cover over said insert, whereby said fingers and said cover control the dissolving of said insert by controlling the surface area of said insert exposed to the detergent solution; and

(iv) a plurality of locking members and a flange both cooperatively connected to said ring, whereby said retaining ring is locked into position in said opening by said locking members and flange; and

(d) spray-forming nozzle means mounted to extend into said cavity through said circular opening, said inner apertures

and said inner opening, whereby a pressurized spray of liquid is directed towards the detergent, such that hydraulic action of said nozzel directed spray dissolves a portion of the detergent, and forms a detergent solution which passses by gravity over said insert and dissolves a portion of said insert, and whereby the detergent solution and dissolved insert are discharged out of said circular opening through said inner aperture.

4,571,328

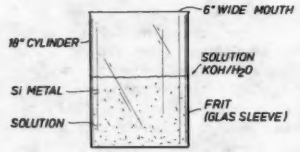
AQUEOUS HYDRIDES

G. Kenneth Rice, Sugarland, Tex., assignor to Teknico Industries, Inc., Richmond, Tex.

Continuation-in-part of Ser. No. 671,684, Nov. 15, 1984, abandoned, which is a continuation of Ser. No. 527,752, Aug. 30, 1983, abandoned. This application Apr. 15, 1985, Ser. No. 723,530

Int. Cl.[4] C01G *23/00*

U.S. Cl. 423—69 **4 Claims**



1. A metal compound formed by combining a metal selected from the group consisting of silicon, aluminum, beryllium, titanium, zinc, and tin, with an alkali metal hydroxide, and water, in the ratio by mole percent as follows:

	Metal	Alkali Metal Hydroxide	H_2O
Silicon	6	1	10
Aluminum	2	1	8
Beryllium	2	1	6
Titanium	5	1	10
Zinc	1	1	6
Tin	5	1	10.

4,571,329

AMMONIA REDUCTION-DENITRATION PROCESS AND APPARATUS THEREFOR

Yasuyoshi Kato; Kunihiko Konishi, and Masao Ohta, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 639,933

Int. Cl.[4] B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 **10 Claims**

1. A process for the reduction of nitrogen oxides including nitrous oxide (N_2O) in an exhaust gas with ammonia (NH_3) wherein N_2O is present in the exhaust gas or is created in said process by a reaction of ammonia reducing nitrogen dioxide (NO_2), said process comprising:

contacting the exhaust gas with ammonia in the presence of a catalyst consisting of zeolite ion substituted with hydrogen and iron, said catalyst being able to:

(a) catalyze the formation reaction of nitrogen (N_2), N_2O and water from NO_2 and NH_3; as well as

(b) catalyze the formation reaction of N_2 and water from NH_3 and said N_2O created by the reaction in (a);

wherein NO_2 conprises at least 50% by weight of said nitrogen oxides; and

wherein the ratio of NH_3 to NO_2 is at least 1.3.

4,571,330

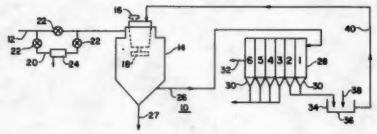
FLUE GAS DESULFURIZATION

Henry V. Krigmont, Van Nuys; Harold H. Haaland, North Hollywood; Ronald J. Triscori, Monrovia; Herbert W. Spencer, III, Valencia, and Jay L. Stern, Los Angeles, all of Calif., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 29, 1983, Ser. No. 537,125

Int. Cl.[4] C01B *17/00*; B01J *8/00*

U.S. Cl. 423—242 **15 Claims**



1. A process for desulfurization of a flue gas containing sulfur oxides, comprising:

spraying an aqueous feed comprising a reagent reactive with said sulfur oxides into said flue gas in a spray dryer absorber, thereby simultaneously drying said sprayed feed and reducing the sulfur oxide content of said flue gas, and forming a dry powder;

conducting said dry powder and said gas reduced in sulfur oxide content to a gas-particulate separator;

collecting said powder from said separator in a plurality of chambers;

determining, in each of said chambers, the value of at least one of a physical and a chemical parameter of said powder indicative of reactivity with sulfur oxides;

selecting, based on said determined values, those chambers containing powder having a greater indication of reactivity with sulfur oxides; and preparing said aqueous feed from an aqueous medium and dry powder from said selected chambers.

4,571,331

ULTRAFINE POWDER OF SILICON CARBIDE, A METHOD FOR THE PREPARATION THEREOF AND A SINTERED BODY THEREFROM

Morinobu Endou, Nagano; Minoru Takamizawa, Tokyo; Tatsuhiko Hongu, Kanagawa; Taishi Kobayashi; Akira Hayashida, both of Niigata; Nobuaki Urasato, Nagano; Hiromi Ohsaki, Niigata; Nichiro Suzuki, and Takasi Toide, both of Fukui, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,389

Int. Cl.[4] C01B *31/36*

U.S. Cl. 423—345 **3 Claims**

1. A method for preparation of a silicon carbide powder composed of polycrystalline agglomerate particles of silicon carbide each having a substantially spherical configuration of 0.01 to 1 μm diameter and formed of crystallites of β-type silicon carbide with a size of not exceeding 5 nm which comprises pyrolyzing, in a vapor phase, a methyl hydrogen(poly)silane compound represented by the general formula $(CH_3)_aSi_bH_c$, in which the suffix b is 1, 2 or 3 and the suffixes a and c are related to b by the set of equations and inequalities $2b+1 \geqq a$, $a \geqq b$, $2b+1 \geqq c \geqq 1$ and $a+c=2b+2$, diluted with a carrier gas to a concentration in the range from 0.2 to 40% by volume in the gaseous mixture at a temperature in the range from 750° to 1600° C.

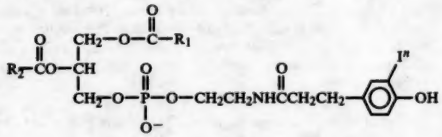
4,571,332

^{125}I AND ^{131}I LABELED PHOSPHOLIPIDS

Alan J. Schroit, Gaithersburg, and Isaiah J. Fidler, Frederick, both of Md., assignors to Litton Bionetics, Inc., Kensington, Md.

Filed Sep. 19, 1982, Ser. No. 427,299
Int. Cl.[4] A61K *43/00, 49/00*
U.S. Cl. 424—1.1 17 Claims

1. The radioactive iodine labeled lipid compound



wherein I^n is ^{125}I or ^{131}I, R_1 and R_2 are the saturated or unsaturated C_6 to C_{20} hydrocarbon chains of fatty acids, and R_1 and R_2 may be identical or different.

4,571,333

CONTROLLED RELEASE NAPROXEN AND NAPROXEN SODIUM TABLETS

Charles H. Hsiao, Cooper City, Fla., and John S. Kent, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 14, 1983, Ser. No. 504,112
Int. Cl.[4] A61K *9/22, 9/26*
U.S. Cl. 424—22 27 Claims

1. A controlled release tablet for once-daily oral administration of about 500–1200 mg of naproxen or naproxen sodium, which tablet comprises a homogenous matrix comprising:

about 4–6 weight percent of hydroxypropylmethylcellulose having a number average molecular weight in the range of from about 80,000 to about 130,000,

about 81–96 weight percent of naproxen or naproxen sodium in an amount effective for once daily oral administration,

0.1 to about 2 weight percent of a pharamaceutically acceptable lubricating agent, and

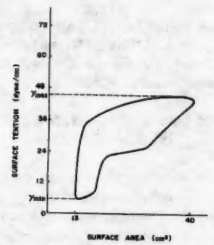
0 to about 8 weight percent of other pharmaceutically acceptable excipients.

4,571,334

COMPOSITION FOR CURING RESPIRATORY DISEASES

Tsunemasa Yoshida; Toshio Wakabayashi, both of Tokyo, and Keizo Matsumoto, Nagasaki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 4, 1981, Ser. No. 327,396
Claims priority, application Japan, Dec. 4, 1980, 55-170222
Int. Cl.[4] A61K *31/395, 35/12*
U.S. Cl. 424—95 8 Claims



1. A composition for curing respiratory diseases, which composition is to be directly administered by inhalation or infusion into the lungs, which contains a therapeutically effective amount of a medicine for respiratory disease and naturally or artificially prepared lung surfactant in an amount sufficient to promote absorption of the medicine or to assist respiratory function, said lung surfactant being characterized by a singular surface activity which makes the surface tension of the inner surface of the alveolium vary in accordance with the expiration and inspiration and contributes to the maintenance of interalveolium functional stabilization to exercise an antiatelectatic action and said surfactant having a minimum surface tension of 20 dyne/cm or less on a modified Wilhelmy balance.

4,571,335

METHOD OF INHIBITING HERPETIC LESIONS BY THE USE OF PLATINUM COORDINATION COMPOUNDS

Robert C. Taylor, 3610 W. Drahner, Oxford, Mich. 48051; Sarah G. Ward, 53460 Mound Rd., Utica, Mich. 48087, and Parbury P. Schmidt, 714 Cambridge, Rochester, Mich. 84063

Filed Jun. 17, 1983, Ser. No. 505,216
Int. Cl.[4] A61K *33/24, 31/28, 31/555*
U.S. Cl. 424—131 1 Claim

1. A method of eliminating herpetic lesions on the skin of a human comprising applying to the surface of each lesion a herpes virus lesion inhibiting amount of cisplatin contained in a pharmaceutical composition in topical dosage form.

4,571,336

IMMUNE STIMULATION

John C. Houck, and Leonard M. Patt, both of Seattle, Wash., assignors to Endorphin, Inc., Seattle, Wash.

Continuation of Ser. No. 526,356, Aug. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 419,995, Sep. 20, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 694,899
Int. Cl.[4] A61K *37/02, 35/26;* C07G *7/026*
U.S. Cl. 424—95 4 Claims

1. An immunostimulator factor isolated from bovine thymus which is a peptide having the properties of:

A. Strong adherence to Sephadex and BioGel-P at pH 4.5 to 8,

B. An isoelectric point of about 7.0 to 7.8,

C. Stimulating the DNA-synthetic response of both murine and human lymphocytes to alloantigenic stimulation in a two way MLC,

D. Not significantly increasing the stimulation of murine splenic lymphocytes by β-lipopolysaccharides,

E. Ability to enhance immunostimulatory response even in the presence of 2-mercaptoethanol,

F. Totally reversible in MLC if removed up to 72 hours from the start of MLC,

G. Functioning more effectively in MLC containing 10% human serum than in MLC medium containing 10% fetal calf serum,

H. Ability to enhance immunostimulatory response in MLC even in presence of mouse serum,

I. Ability to accelerate the rejection of histoincompatible skin grafts in mice,

J. Ability to pass through dialysis tubing with a 3500 Dalton cut-off,

K. Splitting into two immunostimulatory fractions, one with a molecular weight of about 1400 Daltons and the other less than 1400 Daltons on gel filtration at pH 10.2 in 0.05M ammonium hydroxide.

2. A process for the preparation of an immunostimulatory factor from bovine thymus comprising the steps of:

A. Extracting thymus tissue with aqueous buffer at pH 8.5 at about 0° C. to 5° C.,

B. Centrifuge homogenate at 26,000 to 30,000×g for 20 to 40 minutes at about 0° C. to 5° C.,

C. Reextract pellet from Step B as in Step A and centrifuge homogenate as in Step B,

D. Pool supernatants from Steps B and C and lyophilize,

E. Suspend lyophilized powder in water at about 0° to 5° C. at a concentration of from 0.25 to 0.3 gm/ml and slowly add absolute ethanol with stirring to a final concentration of 50% to 60% (V/V),

F. Stir for 16 to 18 hours at 0° to 5° C. and centrifuge at 26,000 to 30,000×g for 20 to 40 minutes,

G. Add supernatant to 5 to 6 volumes of acetone at about −10° C. to −5° C. and let stand for 3 to 6 days at about −10° C. to −5° C.,

H. Separate precipitate, suspend in about 100 to 200 ml of distilled water or the same amount of about 20 mM acetic acid and lyophilize at 0° to 5° C.,

I. Dissolve lyophilized powder in buffer at pH 4.5 to 8 and separate over Sephadex or BioGel equilibrated wih the same buffer,

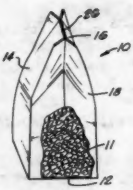
J. Collect fractions and assay by MLC to select the fractions with immunostimulatory activity.

4,571,337

CONTAINER AND POPCORN INGREDIENT FOR MICROWAVE USE

James K. Cage, Santa Ana; Shanti Kolla, Ontario, and Jan E. Gates, Anaheim, all of Calif., assignors to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Continuation of Ser. No. 609,279, May 10, 1984, abandoned.
This application Jul. 1, 1985, Ser. No. 750,982
Int. Cl.[4] B65D *81/34*
U.S. Cl. 426—107 **13 Claims**



13. For use in a microwave oven, a shelf-stable combination of an easily opened bag and a mixture of edible popcorn ingredients for popping therein:

said bag comprising a front panel, a back panel and inwardly folded gussetted side panels, said panels being arranged such that said bag can be flattened with said gussets closed and said front and back panels contacting each other along a center strip between said gussets, said bag then forming a top edge having the least thickness along said center strip;

said panels comprising a structural outer layer, and an inner layer that is non-wicking with respect to grease and transparent to microwave energy, portions of said panels constituting seal means formed by pressure and heat along said top edge such that opposing surfaces of said inner layer are adhered to each other relatively more securely along first seal areas corresponding to said gussets and relatively less securely along a second seal area corresponding to said center strip, said seal means being effective for (1) closing said entire top edge prior to heating of said ingredients to cause popping and maintaining said top edge in a closed condition for a part of said heating to cause steam to be retained during heating and popping of said ingredients until a predetermined internal pressure is reached, (2) opening automatically along at least a portion of said second seal area in response to said predetermined internal pressure during popping to allow steam to escape, and (3) opening further along at least a portion of said first seal area in response to being pulled at diagonally opposite corners formed by said gussets; and

said ingredients being disposed within said bag and comprising shortening and corn kernels having a moisture content of at least about 11.5 percent by weight, whereby sufficient internal pressure is generated at a temperature of not more than 350° to 450° F. to open said seal along at least a portion of said top edge.

4,571,338

METHOD FOR PREPARING MILK SHAKE BEVERAGE

Shigeo Okonogi, Tokyo; Kunisuke Kuwahara, Yokohama; Katsushige Tanaka, Hachioji; Keiji Iwatsuki, Yokohama; Toshiaki Shimokawa, and Masaru Matsuzaki, both of Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,348
Claims priority, application Japan, Jul. 13, 1983, 58-126145
Int. Cl.[4] A23C *3/02, 9/154*
U.S. Cl. 426—324 **1 Claim**

1. In a process for preparing a milk shake beverage, including the steps of sterilizing a liquid mixture containing a milk constituent and other constituents sufficient to make a non-frozen, drinkable, foamable milk shake beverage upon shaking said liquid mixture in a container, aseptically homogenizing the sterilized mixture, aseptically filling the homogenized mixture into a container and hermetically sealing the container, the improvement comprising; prior to said sterilizing, adding to the mixture guar gum in a proportion of at least 0.04 to 0.07% by weight, based on the weight of the mixture, and kappa carrageenan and xanthan gum in respective proportions, calculated from the following equations (1) and (2), and sucrose in a proportion of 4 to 10% by weight based on the weight of the mixture, and sterilizing the mixture at a temperature of 135° to 150° C. for 2 to 5 seconds, whereby the milk shake beverage having at least 60% by volume in overrun and at least 70 ml of foam per 130 ml of the mixture is obtained;

$$83X+241C=82-OR \quad (1)$$

$$250X+145C=ST-15 \quad (2)$$

wherein C stands for weight percent, based on the weight of the mixture, of kappa carrageenan added to the mixture and is at least 0.025, X stands for weight percent based on the weight of the mixture, of xanthan gum added to the mixture and is at least 0.03, OR stands for volume percent of overrun in the final product and is at least 60, and ST stands for milliliters of foam per 130 ml of the mixture, said foam being measured by shaking the final product and thereafter allowing it to stand for 10 minutes, and is at least 70.

4,571,339

PROCESS FOR EFFICIENTLY CONCENTRATING AN AROMA STREAM

Saul N. Katz, Monsey, and Gerald J. Vogel, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 7, 1985, Ser. No. 699,362
Int. Cl.[4] A23F *5/48*
U.S. Cl. 426—387 **8 Claims**

1. A process for enhancing the aroma constituency of soluble coffee which comprises adding to an aqueous coffee aroma stream at least 0.5% by weight salt, mild caustic or a mixture thereof, in an amount effective to increase the relative volatility of the coffee aromas contained therein by at least 5%, to form an addition product, distilling the addition product to recover a more concentrated coffee aroma, and adding the recovered coffee aroma to a coffee substrate.

4,571,340

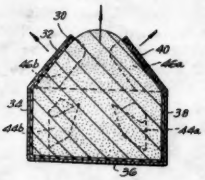
METHOD OF BAKING PRE-PROOFED FROZEN DOUGH IN AN OVENABLE SELF-OPENING CONTAINER

Joseph G. Ferrante, Irvington, N.Y.; Henry J. Victoria, Allendale, N.J., and George Mileos, Riverdale, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 13, 1984, Ser. No. 570,723

Int. Cl.[4] A21D *8/06*; B65B *29/08, 25/16*; B65D *81/34*

U.S. Cl. 426—393 4 Claims



1. A method for baking a pre-proofed frozen dough product by utilizing a self-opening, rectilinearly-shaped, ovenable storage and preparation container comprising the steps of:

(a) placing a pre-proofed dough ingot within said container, then overwrapping said container and freeze sttoring the overwrapped container, said container comprising:

(i) opposing side walls,

(ii) opposing end walls,

(iii) a bottom panel,

(iv) hook-shaped closure flaps which are intergrally formed as extensions of said side walls and which are foldedly inserted into slits in said end walls so that the side and end walls remain immovably upright,

(v) opposing longitudinally-paralled top closure panels folded downwardly along fold lines located along the top of said paralled side walls so as to form adjacently abutting closure panels which are upwardly and outwardly movable in response to the urging of said dough ingot during baking,

(vi) foldable flaps located at each end of said top closure panels said flaps being inserted within the body of the container and effective to remain the top closure panels in a closure position during early baking stages,

(b) thereafter, removing said overwrapped container from freezer storage and removing said overwrapping from said container;

(c) placing the unwrapped container containing said pre-proofed frozen dough ingot within an oven and heating said oven to a temperature appropriate to effect baking;

(d) maintaining said temperature so that an elevated humidity is generated within the closed container during an initial period of baking of the dough ingot;

(e) continuing baking of said dough ingot for a period sufficient to effect rising of the dough so that the dough pushes upwards and urges said abutting, top closure panels upwardly and outward, thereby exposing said dough to the oven's environment and allowing the exposed dough to attain a golden brown appearance; and thereafter,

(f) removing the baked dough and container from the oven.

4,571,341

PROCESS FOR CONTINUOUS RICE COOKING BY STEAMING AND APPARATUS THEREFOR

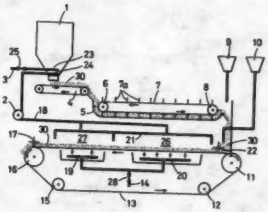
Tsuyoshi Sugimura, 2-4, Azumacho, 2-chome, Ageo-shi, Saitama-ken, Japan

Filed Jul. 26, 1984, Ser. No. 634,834

Claims priority, application Japan, Jul. 27, 1983, 58-135785; Dec. 28, 1983, 58-248800

Int. Cl.[4] A23L *1/10, 3/18*

U.S. Cl. 426—510 7 Claims



1. A process for continuously cooking rice by steaming which comprises steps of:

(a) continuously feeding steeped rice into a vertical steamer;

(b) promoting the gelatinization of the rice by gradually heating the rice in said steamer with jets of steam;

(c) cooking and hydrating the heated rice by discharging the heated rice from said steamer and passing it through a bath containing hot water at a temperature of 60° C. to 100° C.;

(d) transferring the cooked, hydrated rice onto a net conveyor; and

(e) then finish-steaming the rice being conveyed by the net conveyor by subjecting the cooked, hydrated rice to jets of steam at a temperature of at least 101° C.

4,571,342

CHARCOAL BROILED FLAVOR COMPOSITION

Franscesco DiCicca, Ramsey; Farid M. Fahmy, Clifton, and Ferdinand Triolo, Jackson, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 291,755, Aug. 10, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,165

Int. Cl.[4] A23L *1/231*

U.S. Cl. 426—533 20 Claims

1. A process for preparing a flavor composition comprising providing a flavor producing composition consisting essentially of a fat or oil suitable for producing a charcoal broiled flavor; subjecting a film of said fat or oil to a temperature within the range of 285° C. to 475° C. in the presence of oxygen for a period of time effective to develop a charcoal broiled flavor and collecting the resultant fat or oil.

4,571,343

FLAVORING WITH ORTHO-DIOXYBENZALDEHYDE DIMETHYL MERCAPTALS

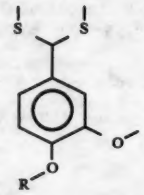
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 1, 1985, Ser. No. 729,237

Int. Cl.[4] A23L *1/226*

U.S. Cl. 426—535 3 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.1 parts per million up to about 250 parts per million by weight of said foodstuff of at least one ortho-dioxybenzaldehyde dimethyl mercaptal defined according to the structure:



wherein R represents hydrogen or methyl.

4,571,344

FLAVORING WITH DITHIOETHERS OF 2-PHENYL-2-ALKENALS

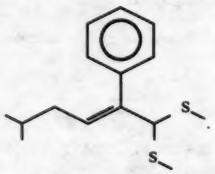
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 23, 1985, Ser. No. 726,352

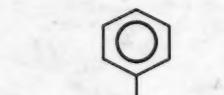
Int. Cl.[4] A23L *1/226, 1/235*

U.S. Cl. 426—535 **3 Claims**

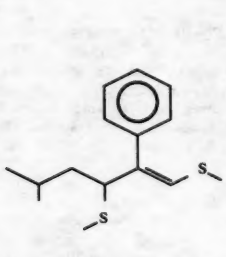
1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff about 0.1 parts per million up to about 250 parts per million of the compound having the structure:



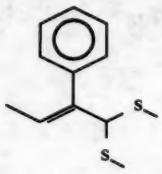
2. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff 0.1 parts per million up to about 250 parts per million of a 90:10 mixture of compounds having the structures:



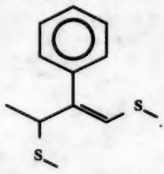
and



3. A product for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding the said foodstuff 0.1 parts per million up to about 250 parts per million of a 4:6 mixture of compounds having the structures:



and



4,571,345

1,1-DIAMINOALKANE DERIVED SWEETENERS

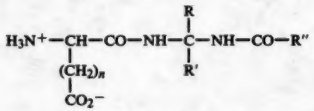
Michael S. Verlander, Del Mar; William D. Fuller, San Diego, and Murray Goodman, La Jolla, all of Calif., assignors to Cumberland Packing Corp., Brooklyn, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,853

Int. Cl.[4] A23L *1/236, 1/226*

U.S. Cl. 426—548 **19 Claims**

1. A compound of the formula:



wherein:

n is 0 or 1,

R is lower alkyl, lower hydroxyalkyl or lower thio-alkyl,

R′ is hydrogen or lower alkyl, and

R″ is branched alkyl of 3–10 carbon atoms, cycloalkyl of 3–7 carbon atoms, cycloalkyl substituted by 1–5 lower alkyl groups, lower alkyl-cycloalkyl, dicycloalkyl, heterocycloalkyl wherein the hetero atom is oxygen, nitrogen or sulfur and the cycloalkyl group is of 4–7 carbon atoms, lower alkyl-substituted heterocycloalkyl, fused polycycloalkyl, phenyl or lower alkyl-substituted phenyl.

17. A composition for sweetening edible materials which comprises a sweetening effective amount of a compound of claim **1** and a nontoxic carrier.

4,571,346

METHOD FOR PRODUCING COLD-WATER SOLUBLE GELATIN DESSERT MIXES AND PRODUCTS THEREFROM

Douglas M. Lehmann, Howell; Gordon F. Kunz, Windsor; Paul A. Kirkpatrick, Jackson; Nancy A. Swallow, Plainsboro; Richard R. Leshik, Eging Township, Mercer County, and Marvin Schulman, Howell, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 1, 1984, Ser. No. 636,537

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **8 Claims**

1. A process for agglomerating an amorphous gelatin-containing mix which is readily soluble and dispersible in water at 50° F. in the absence of added moisture comprising the steps of:

(a) preparing a mix containing (i) at least 20% by weight amorphous gelatin, said gelatin having a particle size wherein at least 50% by weight passes through a 230 mesh U.S.S. sieve, (ii) at least 3% by weight of a powdered, water-soluble, anhydrous, crystalline food acid, said food acid being less than one-half by weight of the gelatin and having a particle size wherein at least 50% by weight of the acid passes through a 200 mesh U.S.S. sieve, and (iii) at least 30% by weight of a ground material selected from

the group consisting of sugar, sugar polymers and combinations thereof, said ground material being present at a level which is at least 50% the weight of gelatin and having a particle size wherein at least 50% by weight passes through a 100 mesh U.S.S. sieve and wherein said mix has a total moisture content of from 0.8% to less than 5% by weight of the mix and said mix is essentially free of ingredients which have a melting point at or below 200° F.;

(b) continuously agitating the mix while raising the temperature of the agitated mix to between about 180° to 200° F. said temperature being sufficient to effect agglomeration of the mix;

(c) promptly cooling the agglomerated mix to below about 120° F. while continuing to agitate the mix at least during the initial stages of cooling;

(d) sizing the agglomerated mix to obtain a desired particle size fraction by weight; and

(e) packaging the agglomerated, sized mix in moisture-proof packaging material.

4,571,347
EDIBLE COMPOSITION COMPRISING DISCRETE FAT-BEARING PARTICLES IN A FAT-BEARING MATRIX

Henry J. Izzo, Bridgewater, and John P. McNaught, Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 551,774, Nov. 14, 1983, Pat. No. 4,546,003, which is a continuation-in-part of Ser. No. 402,710, Jul. 28, 1982, abandoned. This application Jul. 26, 1985, Ser. No. 759,394

Int. Cl.[4] **A23C** *15/02, 19/00;* **A23D** *3/02, 5/02*

U.S. Cl. 426—581 **19 Claims**

1. A method for preparing an edible food composition comprising discrete particles containing 10 to 100% by weight of fat and having a particle size of 0.04 to 10.0 mm in a fat-bearing plastic or semi-plastic matrix comprising 10 to 100% by weight of fat which comprises the steps of introducing 0.1 to 80% by weight of said particles into said matrix at a temperature below the melting point of the particles while the matrix is in a liquid super cooled state; and cooling the composition thereby converting said liquid matrix to a plastic or semi-plastic state.

4,571,348
REDUCING HYDROGEN CONTENT OF VACUUM DEPOSITED FILMS

John R. Troxell, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1984, Ser. No. 638,906

Int. Cl.[4] **H01L** *21/302*

U.S. Cl. 427—38 **2 Claims**

1. In a method of rapidly heat treating a plasma enhanced chemical vapor deposited silicon layer to make the silicon layer more suitable for formation of semiconductive devices therein, which layer has been deposited on a glass substrate at temperature below about 400° C., is inherently amorphous as deposited, and contains hydrogen that blisters the layer when the layer is rapidly heated, the improvement in which prior to such rapid heat treatment, silicon ions are implanted into the amorphous silicon layer to an average depth at least one-half the thickness of the amorphous silicon layer, and the silicon ions are implanted in a dosage sufficient to enhance hydrogen diffusion into the layer bulk from the layer lower surface, from the layer bulk to its upper surface, and from the layer upper surface to its ambient, effective to allow subsequent rapid heat treatment of the amorphous silicon layer without concurrently forming hydrogen bubbles that would otherwise form therein and damage the amorphous silicon layer during such rapid heat treatment.

4,571,349
CROSSLINKABLE ORGANOPOLYSILOXANES AND A METHOD FOR PREPARING THE SAME

Friedrich Hockemeyer, Griesbach; Peter John, Burghausen; Johann Müller, Burghausen, and Gerhard Preiner, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 28, 1984, Ser. No. 687,397

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402317

Int. Cl.[4] **B05D** *3/06*

U.S. Cl. 427—54.1 **9 Claims**

1. Organopolysiloxanes in which at least 95 mol percent of the siloxane units consist of units of the formulas:

(a) $HR^1C{=}CR^2COOR^3SiR_2O_{\frac{1}{2}}$

(b) HSR^4SiRO and

(c) R_2^5SiO

where R is selected from the group consisting of a monovalent hydrocarbon radical and a halogenated monovalent hydrocarbon radical, R^1 is selected from the group consisting of hydrogen, a phenyl radical and a halogenated phenyl radical, R^2 is selected from the group consisting of hydrogen and an alkyl radical containing from 1 to 4 carbon atoms per radical, R^3 is selected from the group consisting of a divalent hydrocarbon radical and a halogenated divalent hydrocarbon radical, R^4 is a divalent hydrocarbon radical, R^5 is selected from the group consisting of R and a hydrocarbon radical substituted with the $HR^1C{=}CR^2COO$ group, where R^1 and R^2 are the same as above, in which two siloxane units of the formula $HR^1C{=}CR^2COOR^3SiR_2O_{\frac{1}{2}}$ are present per molecule and at least 95 percent of the Si-bonded oxygen atoms present in the siloxane units having the HS group are present in the ≡Si-OSi≡ grouping.

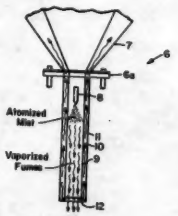
4,571,350
METHOD FOR DEPOSITING THIN, TRANSPARENT METAL OXIDE FILMS

Edwin H. Parker, LaGrange, Ky., and Giacomo J. Piazza, Elmira, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 24, 1984, Ser. No. 653,156

Int. Cl.[4] **C03C** *17/245;* **B05D** *5/12, 5/06*

U.S. Cl. 427—109 **4 Claims**



1. A method for preparing a thin, transparent metal oxide film of exacting uniform thickness through the pyrolysis of at least one metal salt which comprises the steps of:

(a) spraying an atomized mist of said metal salt into a fuming chamber heated to a temperature sufficient to vaporize said mist;

(b) drawing the resultant fumes out of said chamber into contact with the surface of a substrate which is at a temperature essentially equivalent to that of said fumes at the exit end of said chamber, said fumes being drawn out of said chamber by negative pressure at the exit end thereof and said temperature being sufficient to thermally decompose said metal salt and deposit a film of metal oxide and said substrate.

4,571,351

METHOD FOR COATING BACK-CLOTH WITH A POWDERY SYNTHETIC PRODUCT

Josef Schaetti, Wallisellen, Switzerland, assignor to Schaetti & Co., Switzerland

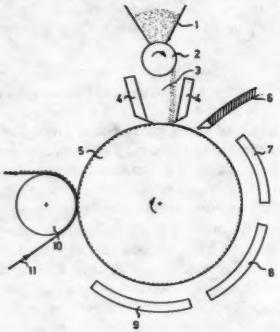
PCT No. PCT/CH83/00114, § 371 Date May 24, 1984, § 102(e) Date May 24, 1984, PCT Pub. No. WO84/01526, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 10, 1983, Ser. No. 616,229

Claims priority, application Switzerland, Oct. 18, 1982, 6045/82

Int. Cl.⁴ B05D *5/00*

U.S. Cl. 427—288 **15 Claims**



1. In a method for coating a back-cloth with a synthetic powder which softens to an adhesive state when heated, said powder being deposited in recesses of a movable intermediary carrier maintained at a temperature that prevents the adhesion of said powder to said intermediary carrier, the improvement comprising moving said carrier with said powder in said recesses, sequentially applying heat directly to said powder deposited in said recesses of said intermediary carrier to change it into said softened adhesive state during movement of said movable intermediary carrier through a zone of direct heat application, and then contacting said softened adhesive powder in said recesses of said intermediary carrier with said back-cloth, said back-cloth at a lower temperature than said intermediary carrier, adhering said synthetic powder to said back-cloth.

4,571,352

METHOD FOR COATING ALUMINUM METAL BODY WITH ALUMINUM ALLOY BRAZING FILLER METAL

Hisao Aoki, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jan. 16, 1985, Ser. No. 691,922

Int. Cl.⁴ B05D *1/18*

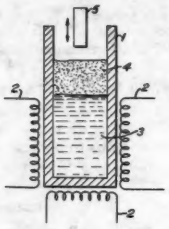
U.S. Cl. 427—431 **4 Claims**

1. A method for coating an aluminum metal body with aluminum alloy brazing filler metal which comprises:

preparing a molten aluminum alloy brazing filler metal in a melting tank, with a flux being melted on the upper surface of said molten aluminum alloy brazing filler metal;

inserting said aluminum metal body into said molten aluminum alloy brazing filler metal through said molten flux layer; and

taking said aluminum metal body out of said molten aluminum alloy brazing filler metal through said molten flux



layer, whereby said aluminum metal body being coated with said aluminum alloy brazing filler metal and said flux.

4,571,353

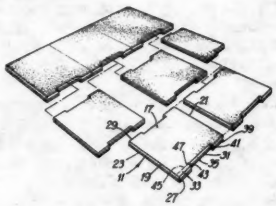
INTERLOCKING CARPET TILE

Carl I. Gable, Jr., Atlanta, Ga., assignor to Interface Flooring Systems, Inc., LaGrange, Ga.

Filed Apr. 26, 1984, Ser. No. 604,168

Int. Cl.⁴ B32B *3/14*

U.S. Cl. 428—33 **6 Claims**



1. A free-lay carpet tile comprising:

(a) an upper pile surface;

(b) a lower surface;

(c) a first stiffening layer;

(d) first and second parallel straight edges; and

(e) a third and a fourth edge, each comprising:

(i) two key sections, each located adjacent to each of the first and second straight edges, and each having:

(x) a key leading edge; and

(y) a key side edge forming an angle with the key leading edge of at least ninety degrees; and

(z) an aspect ratio of less than one; and

(ii) a channel section for receiving key sections from two adjacent like carpet tiles, of an area equal to the area of two key sections, and defined by:

(x) a channel inner edge; and

(y) two key side edges.

4,571,354

TAPE AUTOMATED BONDING OF INTEGRATED CIRCUITS

Michael J. Maxwell, Tempe, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Dec. 27, 1983, Ser. No. 565,463

Int. Cl.⁴ B32B *3/10*

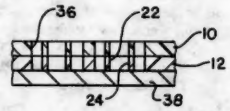
U.S. Cl. 428—78 **4 Claims**

1. A substrate for tape automated bonding of electronic components, the substrate having:

a layer of insulating material;

a layer of adhesive material on a first surface of said insulating material;

a layer of electrically conductive material on said adhesive layer and bonded by said adhesive layer to said insulating material;



a feature window in said layer of insulating material; and

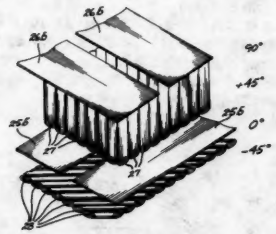
a support ring in said feature window, said support ring being bonded to said layer of electrically conductive material.

4,571,355

FIBER REINFORCED RESIN COMPOSITES FORMED OF BASIC PLY BLANKETS

Samuel D. Elrod, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 28, 1984, Ser. No. 675,746
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—102 **56 Claims**



1. A method of creating a fiber reinforced resin composite layup based on design criteria that specifies fiber orientation directions, fiber percentages in each fiber orientation direction and composite thickness at selected different locations, said method comprising the steps of:

(a) creating a basic ply blanket from a plurality of plies formed of fiber filaments, one ply running in each of said fiber orientation directions, the percentage relationship of the magnitude of the fibers in said plies being the same as said design criteria;

(b) determining the thickness of said basic ply blanket;

(c) dividing the thickness of said basic ply blanket into the thickness of said composite at said selected different locations to determine the number of basic ply blankets needed to meet said design criteria thickness at said selected different locations; and,

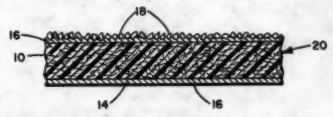
(d) stacking a plurality of basic ply blankets such that the number of said stacked basic ply blankets at each of said selected different location equals said number determined by dividing the thickness of said basic ply blanket into the design criteria thickness at said selected location, whereby the thickness of said stacked basic ply blankets equals said design criteria thickness at each of said selected different locations.

4,571,356

WATER SOLUBLE ONE-COMPONENT POLYMERIC RESIN BINDER SYSTEM FOR FIBERGLASS MATS

James T. White, Sr., Tuscaloosa, and Dan J. Kennedy, Northport, both of Ala., assignors to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Continuation of Ser. No. 593,286, Mar. 26, 1984, abandoned, which is a continuation of Ser. No. 425,657, Sep. 28, 1982, abandoned, which is a division of Ser. No. 160,436, Jun. 17, 1980, abandoned. This application Jun. 13, 1985, Ser. No. 744,844
Int. Cl.[4] B32B *5/16, 17/06*
U.S. Cl. 428—143 **2 Claims**



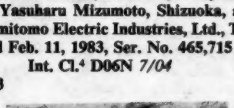
1. A flexible fiberglass shingle for application in the roofing industry formed from a fiberglass mat of chopped strands of fiberglass impregnated throughout with a cured polymeric resin blend, said polymeric resin blend consisting essentially of two ingredients (A) and (B) wherein (A) consists of from about 90 to about 25 percent by weight based upon the total weight of (A) and (B) used of a urea-formaldehyde resin wherein said urea-formaldehyde resin has a molecular weight below 250 and is formed by reacting from about 1.1 to about 3.0 moles of formaldehyde per mole of urea in a conventional manner, and ingredient (B) being from about 10 to about 75 percent by weight based upon the total weight of (A) and (B) of a polymeric material selected from the group consisting of polyvinyl acetate polymers and vinyl acrylic-vinyl acetate copolymers wherein said vinyl acrylic-vinyl acetate copolymers contain from about 1 to about 20 percent by weight butyl acrylate and from about 80 to about 99 percent by weight vinyl acetate and mixtures thereof, wherein the said water soluble storage stable polymeric blend has a viscosity ranging from about 200 to about 700 cps, a pH ranging from about 6.5 to about 8.5 after 24 hours, and a non-volatile content ranging from about 45 to about 65 percent based upon the total weight of said polymeric resin blend; said impregnated fiberglass mat coated on adjacent surfaces with asphalt and with pieces of mineral rock embedded in one of the asphalt surfaces.

4,571,357

ELECTRICALLY INSULATING LAMINATE PAPER FOR OIL-IMPREGNATED ELECTRIC APPARATUS

Ryosuke Hata; Shosuke Yamanouchi; Masayuki Hirose, all of Osaka; Hidemitsu Kuwabara, Shizuoka; Hiroyuki Yamamoto, Shizuoka, and Yasuharu Mizumoto, Shizuoka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Tokyo, Japan

Filed Feb. 11, 1983, Ser. No. 465,715
Int. Cl.[4] D06N *7/04*
U.S. Cl. 428—153 **2 Claims**



1. An electrically insulating laminate paper for an electric apparatus to be wound in a wet state on a conductive material followed by drying and thereafter impregnated with insulating oil comprising an integrated assembly composed of a plastic film layer, and a fiber paper layer treated by having water drops with a wide particle size distribution of 10 to 1000 μm scattered on the surface thereof, wherein said fiber paper is moistened so as to result in a water content of 5 to 25 weight % and the surface of said fiber paper is pockmarked all over to form irregular unevenness.

4,571,358
MATERIALS FOR USE IN TRIBOLOGICAL APPLICATIONS

Nam P. Suh, Sudbury, and Steven M. Burgess, Auburn, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 10, 1984, Ser. No. 609,021
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—155 14 Claims

1. A material having a surface which can be placed in movable contact with another surface, said material having a plurality of microscopic void regions spaced at microscopic distances from each other and extending from the movable surface thereof partially into the interior regions of said material so that, when the movable surface of said material is moved relative to said another surface, microscopic wear particles generated at the interface between said moving surfaces are removed from said interface into said void regions of said material for entrapment therein.

4,571,359
PAPERMAKERS WET-PRESS FELT AND METHOD OF MANUFACTURE

William H. Dutt, Rensselaer, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Dec. 18, 1984, Ser. No. 683,025
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—240 2 Claims

1. A method of manufacturing a composite wet-press felt fabric, which comprises;

providing a wet-press felt base fabric of interwoven machine direction and cross-machine direction yarn;

distributing a layer of loose particles of a synthetic, polymeric resin upon one surface of the base fabric, and

fusing the loose particles under conditions whereby they bond together and with the base fabric, leaving pores between a plurality of particles.

4,571,360
FOAM COMPOSITION USED IN PAPER TREATMENT

Russell L. Brown; George M. Bryant, both of Charleston, and Charles J. Cunningham, Elkview, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 22, 1985, Ser. No. 715,169
Int. Cl.[4] B32B *23/08*
U.S. Cl. 428—318.4 20 Claims

17. A treated paper comprising paper substrate, paper treating agent and an applied amount of foaming agent which is a fatty acid, fatty phosphate ester, reaction product of ammonium compound and fatty acid of fatty phosphate ester, fatty amine oxide or fatty amido betaine which provides a fast-breaking, fast-wetting, limited stability foam of uniform structure, wherein the applied amount of foaming agent provides treated paper comparable to such treated paper but which is substantially free of the foaming agent.

4,571,361
ANTISTATIC PLASTIC FILMS

Hideo Kawaguchi, Kanagawa; Tsutomu Okita, and Hiroyuki Tamaki, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1982, Ser. No. 366,037
Claims priority, application Japan, Apr. 6, 1981, 56-51581
Int. Cl.[4] B32B *5/16, 15/00*
U.S. Cl. 428—328 10 Claims

1. A plastic film with at least one coating layer provided thereon wherein said coating layer is prepared by:

dispersing electrically conductive fine particles having a specific volume resistance of 10^7 Ω-cm or less in a compound containing an unsaturated bond capable of undergoing polymerization on irradiation with radiation or a binder containing the polymerizable compound, said electrically conductive fine particles comprising crystalline metal oxide of Zn, Ti, Sn, In, Si, Mo, or W and/or composite oxide thereof, and said polymerizable compound is selected from the group consisting of monomers, oligomers and polymers each containing a vinyl or vinylidene group;

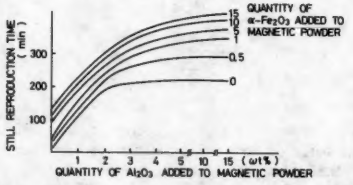
coating the resulting dispersion on the plastic film; and

polymerizing and curing the layer by irradiation with radiation.

4,571,362
MAGNETIC RECORDING MEDIUM

Nobuhiro Sato, Saku; Akira Okada, and Yutaka Nakashima, both of Komoro, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 275,708, Jun. 22, 1981, abandoned.
This application Sep. 21, 1982, Ser. No. 420,903
Claims priority, application Japan, Jun. 23, 1980, 55-84846
Int. Cl.[4] H01F *10/02*
U.S. Cl. 428—329 5 Claims



1. A magnetic recording medium comprising a base material and a coating layer formed thereon, said coating layer comprising a magnetic powder and 0.5–15% by weight of at least one nonmagnetic powder of Al_2O_3 and Cr_2O_3 and 0.5–15% by weight of α-Fe_2O_3, the sum of the proportions of said nonmagnetic powder and α-Fe_2O_3 not exceeding 20% by weight, all on the basis of the weight of said magnetic powder.

4,571,363
POLYESTER FILM PRIMED WITH CROSSLINKED ACRYLIC POLYMERS

E. C. Culbertson, Greer, and Grover L. Farrar, Greenville, both of S.C., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Dec. 12, 1983, Ser. No. 560,648
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—332 23 Claims

1. An oriented self-supporting polyester film prepared by

melt extruding a substantially amorphous polyester film consisting essentically of a mixture of fresh polyester and primer coated reclaim polyester and thereafter orienting the film by stretching in one or two directions and heat setting the film,

said primer coated reclaim polyester being the comminution product of a primer coated oriented polyester film having a continuous cross-linked acrylic coating on one or both sides thereof,

said acrylic coating consisting essentially of a copolymer of at least about 50 percent by weight of polymerized acrylic and/or methacrylic monomers, from about 1 to about 15% by weight of a copolymerized functional group-containing comonomer which in the copolymerized state is capable of inter-molecular crosslinking by the application of heat, and from about 0 to 49% by weight of one or more halogen-free monoethylenically unsaturated copolymerized monomers.

2. The film of claim 1 wherein said primer coating has a dry thickness within the range of about 10^{-7} to 10^{-5} inch.

4,571,364

MAGNETIC RECORDING MEDIUM

Akira Kasuga; Akihiro Matsufuji; Yasuyuki Yamada, and Nobuo Tsuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 10, 1984, Ser. No. 649,326

Claims priority, application Japan, Sep. 8, 1983, 58-165403

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—336 **20 Claims**

1. A magnetic recording medium comprising a nonmagnetic support having provided thereon a magnetic layer comprising ferromagnetic particles dispersed in a binder, said ferromagnetic particles having a BET specific surface area of 25 m^2/g or more, said binder comprising a modified polyurethane resin containing 0.1 meq/g or more of functional groups selected from carboxyl groups, hydroxyl groups, sulfonic acid groups, and epoxy groups, and containing at least three functional groups per molecule of the resin.

4,571,365

TRANSPARENT, ABRASION RESISTANT COATING COMPOSITIONS

Lysander T. Ashlock, Riverside; Harold Mukamal, Seal Beach, and William H. White, La Puente, all of Calif., assignors to Swedlow, Inc., Garden Grove, Calif.

Continuation-in-part of Ser. No. 136,757, Apr. 3, 1980, Pat. No. 4,500,669, which is a continuation of Ser. No. 845,915, Oct. 27, 1977, abandoned. This application Apr. 1, 1982, Ser. No. 364,446

Int. Cl.⁴ B32B *27/26;* **C08K** *3/08;* **C08L** *83/06*

U.S. Cl. 428—412 **34 Claims**

1. An article manufactured by applying to at least one surface of a substrate a coating composition which forms a transparent, abrasion-resistant coating upon curing, said coating composition consisting of an effective abrasion resisting amount of a colloidal dispersion of a water insoluble dispersant in a water-alcohol solution of the partial condensate of $R(Si(OH)_3)$ wherein R is an organic radical, and said dispersant is an oxide of a metal selected from the group consisting of antimony, aluminum, gold, silver, copper, tin, cadmium, indium, and mixtures thereof, and curing said coating composition.

4,571,366

PROCESS FOR FORMING A DOPED OXIDE FILM AND DOPED SEMICONDUCTOR

Ian M. Thomas, Temperance, Mich., and James J. Tillman, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

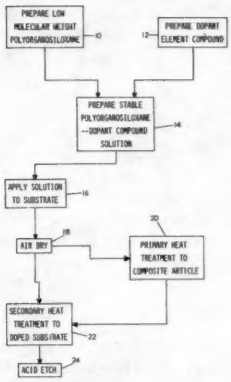
Filed Feb. 11, 1982, Ser. No. 347,834

Int. Cl.⁴ H01L *23/18;* **B32B** *9/04*

U.S. Cl. 428—446 **10 Claims**

1. A semiconductor article having a semiconductor substrate with a dopant element solid state diffused therein from a doping composition layer deposited therein, the layer being heated to form a glassy state and fired to diffuse the dopant element into the substrate and form an SiO_2 layer thereon. the layer being formed by coating the substrate with a doping composition solution comprising

(A) a dopant element compound comprising a reactive dopant source compound in which the dopant is boron or a Group VB element,



(B) a solvent soluble further curable liquid low molecular weight organopolysiloxane that is a reaction product of a silicon alkoxide and water in which the amount of water is less than stoichiometric,

(C) an organic epoxide to provide the solution with a neutral pH, and

(D) an organic solvent for (A), (B) and (C).

4,571,367

HOT-DIP ALUMINUM COATED STEEL STRIP HAVING EXCELLENT STRENGTH AND OXIDATION RESISTANCE AT ELEVATED TEMPERATURES AND PROCESS FOR PRODUCTION THEREOF

Toshiro Yamada; Noriyasu Sakai, and Hisao Kawase, all of Hiroshima, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

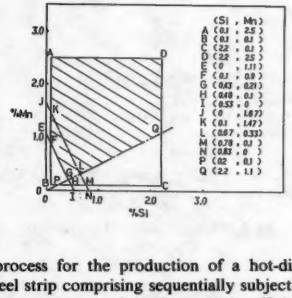
PCT No. PCT/JP84/00343, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00383, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 3, 1984, Ser. No. 709,947

Claims priority, application Japan, Jul. 4, 1983, 58-121277

Int. Cl.⁴ B32B *15/18*

U.S. Cl. 428—653 **6 Claims**



1. A process for the production of a hot-dip aluminum coated steel strip comprising sequentially subjecting a slab of steel having an amount of titanium added sufficient to fix the carbon and nitrogen in said steel as stable precipitates and to

provide an excess of uncombined titanium to the steps of hot rolling, descaling, cold rolling, annealing and hot-dip aluminum coating, characterized in

that as said slab use is made of a Ti-added Si-Mn steel which comprises in % by weight up to 0.020% of C, 0.1 to 2.2% of Si, up to 2.5% of Mn, 0.1 to 0.5% of Ti, 0.01 to 0.1% of Al and up to 0.010% of N, the balance being Fe and unavoidable impurities, the % Si, % Mn, % Ti, % C and % N being further controlled in compliance with the relations:

$$1.9\times(\%\ \mathrm{Si})+0.9(\%\ \mathrm{Mn})\geqq 1,$$

$$\%\ \mathrm{Mn}\geqq 0.5\times(\%\ \mathrm{Si}),\ \text{and}$$

$$\%\ \mathrm{Ti}/(\%\ \mathrm{C}+\%\ \mathrm{N})\geqq 10,\ \text{and}$$

that in said hot rolling step the temperature of the hot rolled material being coiled is controlled low enough to provide steel surfaces substantially free from internal oxidation at the end said descaling step.

4,571,368

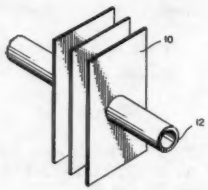
ALUMINUM AND ZINC SACRIFICIAL ALLOY

John C. Fenoglio, Clinton; David L. Wilbur, West Terre Haute, both of Ind., and William H. Anthony, Bartlett, Ill., assignors to Atlantic Richfield Company, Denver, Colo.

Continuation-in-part of Ser. No. 458,255, Jan. 17, 1983, abandoned. This application Jul. 3, 1984, Ser. No. 627,403

Int. Cl.[4] B32B *15/20;* **C22C** *21/02*

U.S. Cl. 428—654 **9 Claims**



1. An improved aluminum base alloy containing a zinc constituent and especially useful as a sacrificial alloy, said alloy consisting essentially of:

0.6–3.0% by weight silicon,
0.2–1.0% by weight iron,
up to 0.2% by weight copper,
0.8–2.0% by weight manganese,
up to 0.2% by weight magnesium,
0.5–2.5% by weight zinc, and
the balance aluminum.

4,571,369

PHOTOCONDUCTIVE FILM AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER USING SAID FILM COMPRISING SILYLATED AZO PIGMENT

Masataka Yamashita, Kiyose, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,333

Claims priority, application Japan, Apr. 20, 1983, 58-68361

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—56 **20 Claims**

1. Photoconductive film which comprises a photoconductive pigment obtained by silylation of an azo series pigment having at least one hydroxy group.

4,571,370

AMORPHUS SILICON AND GERMANIUM PHOTOCONDUCTIVE MEMBER CONTAINING OXYGEN

Keishi Saitoh, Ibaraki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,340

Claims priority, application Japan, Aug. 23, 1983, 58-153673

Int. Cl.[4] G03G *5/02, 5/08*

U.S. Cl. 430—57 **28 Claims**

1. A photoconductive member comprising a substrate for photoconductive member and a light receiving layer provided on said substrate having a layer constitution in which a layer region (G) comprising an amorphous material containing germanium atoms and at least one of hydrogen atoms and halogen atoms and a layer region (S) exhibiting photoconductivity comprising an amorphous material containing silicon atoms and at least one of hydrogen atoms and halogen atoms are successively provided from the substrate side, said light receiving layer having a layer region (O) containing oxygen atoms, the depth profile of oxygen atoms in the layer thickness direction in said layer region (O) having at least a part in which the distribution concentration is increased smoothly and continuously toward the upper end surface of the light receiving layer.

4,571,371

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE LAYER COMPRISING SILICONE COMPOUND LEVELING AGENT

Yuichi Yashiki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,564

Claims priority, application Japan, May 11, 1983, 58-82252

Int. Cl.[4] G03G *15/04*

U.S. Cl. 430—62 **18 Claims**

1. An electrophotographic photosensitive member which comprises an electroconductive layer having a volume resistivity of not more than 10^{13} ohm-cm and containing a mixture of an electroconducitve power, a binder resin and a silicone compound leveling agent, said agent in an amount of 0.001 to 1% by weight of the electroconductive layer, between a substrate made of a metal or alloy and a photosensitive layer.

4,571,372

METHOD FOR COATING A NON-MAGNETIC DEVELOPER ONTO A DEVELOPER HOLDING MEMBER

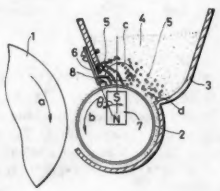
Motoo Urawa, Funabashi; Masanori Takenouchi, Urawa; Fumitaka Kan, Yokohama; Kohshi Suematsu, Kawasaki, and Eiichi Imai, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1984, Ser. No. 602,010

Claims priority, application Japan, Apr. 22, 1983, 58-70996; Apr. 23, 1983, 58-71686; Apr. 23, 1983, 58-71687; Apr. 23, 1983, 58-71688; Apr. 23, 1983, 58-71689; Apr. 23, 1983, 58-71690

Int. Cl.[4] G03G *9/08, 13/06, 15/09*

U.S. Cl. 430—122 **13 Claims**



1. Method for coating a developer on a developer holding member comprising the steps of:

supplying a non-magnetic developer and magnetic particles having a magnetization of 30 emu/g or higher in an external magnetic field of 500 oersted from a storage vessel onto a surface of a developer holding member; and

moving the holding member bearing non-magnetic developer and magnetic particles between a regulating member positioned at the downstream side outlet of the vessel, with respect to the movement direction of the holding member, and a magnetic pole positioned on the opposite side of the holding member to form a magnetic brush with the magnetic particles on the upstream side of the regulating member and inside the vessel to retain substantially the magnetic particles within the vessel and form a thin layer of the non-magnetic developer on the developer holding member downstream of the regulating member.

4,571,373

EXPOSURE LATITUDE IMPROVEMENT IN PRINTING POSITIVE-ACTING COLOR PRE-PRESS PROOFS

Arlene K. Musser, Oakdale, and Peter M. Koelsch, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 11, 1984, Ser. No. 619,001
Int. Cl.[4] G03C *5/18, 7/12;* G03F *3/10*
U.S. Cl. 430—143 **4 Claims**

1. A process for improving the exposure latitude in a positive-acting color pre-press proofing photosensitive article comprising the steps of:

(1) placing an optical filter between said color pre-press proofing photosensitive positive-acting article and a source of actinic radiation, said optical filter having a transmission optical density of between 0.5 and 2.5 at a major radiation absorption peak of said photosensitive article, and

(2) placing a separation half-tone positive image, between said optical filter and the source of radiation, and

(3) exposing said photosensitive positive-acting article with actinic radiation which passes from said source of actinic radiation and through said optical filter and said half-tone positive image to said photosensitive article.

4,571,374

MULTILAYER DRY-FILM POSITIVE-ACTING LAMINABLE PHOTORESIST WITH TWO PHOTORESIST LAYERS WHEREIN ONE LAYER INCLUDES THERMAL ADHESIVE

John P. Vikesland, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 27, 1984, Ser. No. 686,838
Int. Cl.[4] G03C *1/54, 1/60, 1/495*
U.S. Cl. 430—156 **14 Claims**

1. A dry-film, positive acting, laminable photoresist of at least two layers comprising:

(a) a first layer of a positive-acting photoresist layer, comprising an organic polymeric binder having at least one positive-acting photosensitizer therein, said first layer becoming more soluble in an aqueous alkaline solution or organic solvent after exposure to actinic radiation, and

(b) a second photoresist layer laminable to a receptor layer, adjacent and adhered to a surface of said first layer, of a thermally laminable adhesive organic polymer which second layer becomes more soluble in an aqueous alkaline solution or organic solvent after exposure to actinic radiation and which second photoresist layer contains a lower effective amount of positive-acting photosensitizer than said first layer

said organic photoresist layer consisting essentially of organic polymeric binder and positive-acting photosensitizer, and said second photoresist layer being capable of generating between 30 and 90% of the number amount per volume of soluble species from said photosensitizer as compared to said first layer, said photoresist having reduced undercutting as compared to a photoresist without photosensitizer in said second layer.

4,571,375

RING-OPENED POLYNORBORNENE NEGATIVE PHOTORESIST WITH BISAZIDE

George M. Benedikt, 12900 Lake Ave., Lakewood, Ohio 44107

Continuation-in-part of Ser. No. 544,664, Oct. 24, 1983, abandoned. This application May 24, 1984, Ser. No. 613,550
Int. Cl.[4] G03C *1/52, 1/71*
U.S. Cl. 430—197 **13 Claims**

1. A negative photoresist composition capable of forming by exposure of a film about 1 micron thick of a photosensitized ring-opened polycyclic norbornene ("PolyNB") polymer composition to ultraviolet light in the range from about 220–450 nanometers in the contact mode, a pattern of lines and spaces which upon development in a substantially aliphatic hydrocarbon solvent is capable of providing a resolution in the range from about 1 micron to about 2 microns in said pattern, said polymer composition having as an essential component, a major molar amount of a ring-opened unsubstituted or non-polar group substituted tetracyclic norbornene, and a minor molar amount greater than zero of another norbornene, and including an effective amount sufficient to yield a photocross-linked polymer developable into said pattern, of an aryl bis-azide sensitizer in admixture with said PolyNB polymer which has a glass transition temperature before it is crosslinked, higher than 150° C.

13. A light-sensitive photographic material comprising a substrate and a coating thereon of a negative photoresist comprising,

(a) a ring-opened polycyclic norbornene ("PolyNB") homopolymer having a glass transition temperature greater than 150° C. and a structure represented by the formula

wherein,

R^1 and R^2 are each independently hydrogen, alkyl or alkylene having from 1 to about 10 carbon atoms provided that the total number of carbon atoms for R^1 and R^2 is not greater than 20; or,

R^1 and R^2 are each independently phenyl or naphthyl; or,

R^1 and R^2 may be connected to form cycloalkyl or cycloalkylene having from 5 to 10 ring carbon atoms, either of which cycloalkyl or cycloalkylene may have a benzo- or naphto- substituent; and,

(b) an aryl bis-azide sensitizer in sufficient amount which upon exposure to u-v light in the range from 220–450 nanometers yields a crosslinked polymer developable into a pattern with a substantially aliphatic hydrocarbon solvent so as to provide a resolution in the range from 1 micron to about 2 microns in said pattern.

4,571,376

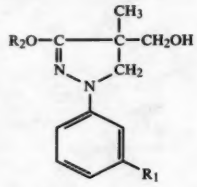
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT WITH 1-M-(METHYL OR ETHYL)PHENYL-4-METHYL-4-HYDROXYMETHYL PYRAZOLIDINONES

Toru Harada; Shigeo Hirano; Shigeru Nakamura, all of Kanagawa, and Isao Shimamura, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 19, 1985, Ser. No. 746,481
Claims priority, application Japan, Jun. 19, 1984, 59-126268
Int. Cl.[4] G03C *1/40, 5/30, 5/54*
U.S. Cl. 430—218 **14 Claims**

1. A color diffusion photographic film unit comprising (a) a light sensitive element comprising at least one photosensitive

silver halide emulsion layer associated with a redox compound adapted to release a diffusible dye, (b) an image receiving element, and (c) an alkaline processing composition element, wherein a 1-m-alkyl-substituted phenyl-3-pyrazolidinone electron transfer agent of the following general formula (I) or a precursor thereof is incorporated in at least one of said elements (a) through (c)



(I)

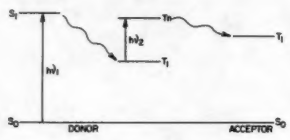
wherein R_1 is methyl or ethyl and R_2 is hydrogen or a group cleavable under alkaline conditions.

4,571,377

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A PHOTOSENSITIVE DONOR AND PHOTOINITIATING ACCEPTOR

Vincent D. McGinniss, Delaware, and Robert E. Schwerzel, Powell, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 23, 1984, Ser. No. 572,938
Int. Cl.[4] G03C *1/68*
U.S. Cl. 430—81 **6 Claims**



1. In a photopolymerizable vehicle of a medium selected from photopolymerizable vinyl monomers, vinyl oligomers, or mixtures thereof, and a photoinitiator system therefor, the improved photoinitiator system whereby said vehicle is selectively photopolymerized by application of a plurality of different selected wavelengths of energy wherein any single wavelength of energy is inadequate for effecting said photopolymerization and where said different selected wavelengths of energy are sequentially applied to said vehicle, which comprises:

(a) a photosensitive donor lacking photoinitiating groups and responsive to first selective wavelengths of energy for generating primary excited-state donor molecules which are not responsive to said first selective wavelengths of energy, but are responsive to sequentially applied second selective wavelengths of energy for generating secondary higher energy level excited-state donor molecules, said donor selected from the group consisting of 9,10-dibromoanthracene, meso-tetraphenyl-porphyrin, a proto-porphyrin dimethyl ester, and mixtures thereof;

(b) a photoinitiating acceptor having a ground energy state below said primary donor energy state and a lowest primary excited-state at least about 5 kcal/mole greater than said primary excited state of said donor, said secondary higher energy level excited-state donor molecules being at least about 5 kcal/mole greater than said lowest primary excited-state of said acceptor and transferring energy to said acceptor for initiating photopolymerization of said vehicle, said acceptor selected from the group consisting of napthalene sulfonyl chloride, quinoline sulfonyl chloride, α-chloromethyl napthalene, brominated porphyrin, brominated rubrene, and mixtures thereof.

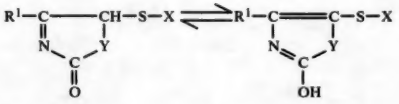
4,571,378

COLOR PHOTOGRAPHIC RECORDING MATERIAL AND DEVELOPMENT PROCESS

Wolfgang Sauerteig; Erwin Ranz, and Heinz Schütz, all of Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,154
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346621
Int. Cl.[4] G03C *1/46*
U.S. Cl. 430—505 **7 Claims**

1. Photographic recording material having at least one more sensitive silver halide emulsion layer (I) and one comparatively less sensitive silver halide emulsion layer (II), both being sensitive to the same spectral region, layers (I) and (II) having DIR compounds of differing reactivities and colour couplers associated therewith, wherein the ratio of the effective reaction velocity constant of the colour coupler to the effective reaction velocity constant of the DIR compound is higher in layer (I) than in layer (II) and wherein the sensitive silver halide emulsion layer (I) contains at least one DIR compound corresponding to the following general formula:



wherein

R^1 represents an unsubstituted or substituted hydrocarbyl group;

Y represents S or NR^2 wherein R^2 represents hydrogen, an unsubstituted or substituted hydrocarbyl group, a heterocyclic group attached through a ring carbon atom or an electron-attracting substituent; and

X represents an aliphatic group, an aromatic group or a heterocyclic group which, when split off with the sulphur atom of the thioether bridge, forms a diffusible mercapto compound which inhibits the development of the silver halide.

4,571,379

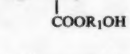
PHOTOGRAPHIC POLYESTER SUPPORTS WITH COPOLYMER SUBBING LAYER

Toshiaki Yamazaki; Takanori Nakadate; Kenichi Kitahara; Noboru Fujimori; Morio Kobayashi, and Ryuji Shimosaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 513,108, Jul. 12, 1983, abandoned. This application Feb. 13, 1985, Ser. No. 701,452
Claims priority, application Japan, Jul. 23, 1982, 57-127467; Jul. 26, 1982, 57-128986; Jul. 27, 1982, 57-129605
Int. Cl.[4] G03C *1/76*
U.S. Cl. 430—534 **10 Claims**

1. A support for use in a light-sensitive photographic material which comprises a subbing layer on at least one side of a polyester substrate, said subbing layer being formed by coating an aqueous composition containing a copolymer consisting essentially of

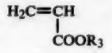
3 to 45% by weight of a monomer of formula (I) based on the weight of said copolymer



(I)

wherein R_1 is an alkylene group having 2 to 4 carbon atoms and R_2 is a hydrogen atom or a methyl group;

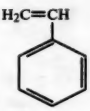
10 to 45% by weight of a monomer of formula (II) based on the weight of said copolymer



(II)

wherein R_3 is a straight chain alkyl group having 2 to 8 carbon atoms; and

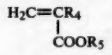
10 to 70% by weight based on the weight of said copolymer of at least one monomer selected from the group consisting of (i) a monomer of formula (III)



(III)

and

(ii) a monomer of formula (IV)



(IV)

wherein R_4 is a hydrogen atom or a methyl group and R_5 is a straight or branched chain alkyl group having 2 to 8 carbon atoms, provided that when R_4 is a hydrogen atom, R_5 is said branched chain alkyl group and, when R_4 is a methyl group, R_5 is said straight chain alkyl group.

4,571,380

SPECTRALLY SENSITIZED INNER LATENT IMAGE TYPE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Yasuhiro Noguchi, and Yuji Mihara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

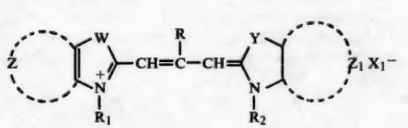
Filed Oct. 27, 1983, Ser. No. 546,214

Claims priority, application Japan, Oct. 27, 1982, 57-188595

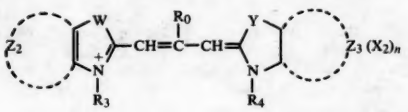
Int. Cl.⁴ G03C *1/02, 1/08*

U.S. Cl. 430—589 **12 Claims**

1. An inner latent image type silver halide photographic emulsion which is spectrally sensitized by adding at least one cyanine sensitizing dye represented by general formula (II) to a direct positive inner latent image type silver halide photographic emulsion and thereafter adding additionally at least one cyanine sensitizing dye represented by general formula (I) to said emulsion:



(I)



(II)

wherein W and Y which may be identical or different from each other each represents an oxygen atom, a selenium atom, a sulfur atom or $>N-R_5$, wherein R_5 represents a lower alkyl group which is unsubstituted or substituted with a halogen atom or a lower alkoxyl group or an allyl group, Z, Z_1, Z_2 and Z_3 each represents an atomic group necessary to form a benzene ring or naphthalene ring, R and R_0 each represents a hydrogen atom, a lower alkyl group, a phenyl group or an aralkyl group, R_1 and R_2 each represents an alkyl group, a haloalkyl group, an alkoxyalkyl group, an aralkyl group, an aryloxyalkyl group or an allyl group, R_3 and R_4 each represents an alkyl group substituted with a carboxyl group or a sulfo group, but at least one of R_3 and R_4 represents an alkyl group substituted with a sulfo group, X_1 represents an anion, X_2 represents an anion or a cation, and n is 0 or 1.

4,571,381

HYBRID CELL LINES PRODUCING MONOCLONAL ANTIBODIES DIRECTED AGAINST NEUROTRANSMITTER DEGRADING ENZYMES

Creed W. Abell, Galveston, and Richard M. Denney, Dickinson, both of Tex., assignors to The University of Texas System Board of Regents, Austin, Tex.

Filed Sep. 29, 1982, Ser. No. 428,344

Int. Cl.⁴ G01N *33/54;* **C12N** *15/00, 5/00;* **C12R** *1/91*

U.S. Cl. 435—7 **3 Claims**

1. A continuous monoclonal hybrid cell line which is clone MAO-1C2 identified as ATCC deposit HB-8176, developed as a fusion between a myeloma cell and a lymphocyte primed to human platelet monoamine oxidase B purified to at least 20% by weight of total protein, which hybrid cell line is capable of producing antibody which reacts with human monoamine oxidase B enzyme and does not react with human monoamine oxidase A enzyme.

4,571,382

PROCESS FOR DETERMINING TUMOR-ASSOCIATED GLYCOLINKAGE AND METHOD FOR DIAGNOSIS OF CANCER

Masakazu Adachi, Gunma, Japan, assignor to Otsuka Pharmaceutical Co., Ltd., Japan

Filed Jul. 30, 1981, Ser. No. 288,445

Claims priority, application Japan, Jul. 30, 1980, 55-104786

The portion of the term of this patent subsequent to Jan. 21, 2000, has been disclaimed.

Int. Cl.⁴ G01N *33/54*

U.S. Cl. 435—7 **20 Claims**

1. A process for determining tumor-associated glycolinkage (TAG), which comprises (1) centrifuging body fluid to separate cells and cell debris contained therein and collecting the supernatant, (2) competitively reacting body fluid TAG contained in the supernatant and a definite quantity of an insolublized TAG or TAG-like material with a definite quantity of labelled lectin, (3) separating the insolubilized TAG or TAG-like material bound to labelled lectin and unbound lectin from each other, and (4) measuring the labelling agent activity of either of them, wherein said TAG-like material is galactose-(β1→3 or β1→4)-N-acetylglucosamine, galactose-(β1→3 or β1→4)-N-acetylgalactosamine or a sugar derivative containing said glycolinkage as a terminal group and wherein said labelled lectin is a lectin which can combine specifically with galactose-(β1→3 or β1→4)-N-acetylglucosamine or galactose-(β1→3 or β1→4)-N-acetylgalactosamine.

4,571,383

REAGENT FOR MEASURING DIRECT BILIRUBIN BY ENZYMATIC METHOD AND METHOD FOR MEASUREMENT THEREOF

Masaharu Takayama, Ibaraki; Seiichi Taniguchi, Neyagawa; Masayasu Enomoto, and Masahiro Muramoto, both of Takatsuki, all of Japan, assignors to Nippon Shoji Kaisha, Ltd., Osaka, Japan

Filed Dec. 19, 1983, Ser. No. 562,741

Claims priority, application Japan, Dec. 29, 1982, 57-230125

Int. Cl.⁴ C12Q *1/26*

U.S. Cl. 435—25 **10 Claims**

1. A diagnostic test kit having component reagents packaged together in a single package; the kit comprising the combination of a buffer solution having a pH range of 3.5 to 4.5, a lyophilized bilirubin oxidase, a buffer solution for dissolving the lyophilized bilirubin oxidase, and a standard serum containing a prescribed amount of bilirubin.

4. A method for measurement of direct bilirubin, which comprises reacting a test serum sample with bilirubin oxidase in a buffer solution of pH 3.5 to 4.5.

7. A reagent for measurement of direct bilirubin, which comprise a lyophilized bilirubin oxidase and a buffer solution for dissolving the lyophilized bilirubin oxidase, said buffer solution having a pH range of 3.5 to 4.5.

4,571,384

METHANE PRODUCTION

Richard Y. Morita, and Ronald D. Jones, both of Corvallis, Oreg., assignors to State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University, Eugene, Oreg.

Filed Oct. 18, 1982, Ser. No. 435,058

Int. Cl.[4] C12P *5/02, 5/00, 1/04;* **C12N** *1/20*

U.S. Cl. 435—167 **8 Claims**

1. A method of producing methane gas comprising:

providing in a closed vessel (a) a bed of particulate mineral carbonate having a solubility of less than 0.1 gms per 100 mls of water at 15° C., (b) a volume of water submersing the bed of mineral carbonate, and (c) a population of anaerobic methanogenic bacteria specifically adapted for the conversion of carbon dioxide to methane attached to the particulate mineral carbonate in said bed,

and with the vessel so provided (d) circulating water through the vessel and (e) passing a flow of hydrogen gas through the vessel, the mineral carbonate in said bed through dissolution introducing dissolved carbon dioxide and mineral ions to the water within the vessel, the methanogenic bacteria utilizing the energy supplied by the hydrogen gas to convert the dissolved carbon dioxide to methane gas, the water circulated through the vessel removing mineral ions introduced by dissolution of the mineral carbonate, and

withdrawing from the vessel the methane gas so produced.

4,571,385

GENETIC REASSORTMENT OF ROTAVIRUSES FOR PRODUCTION OF VACCINES AND VACCINE PRECURSORS

Harry B. Greenberg, Palo Alto, Calif.; Richard G. Wyatt, Potomac, Md.; Albert Z. Kapikian; Anthony R. Kalica, both of Rockville, Md.; Karen Midthun, Sharpsburg, Md., and Robert M. Chanock, Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 27, 1983, Ser. No. 508,323

Int. Cl.[4] C12N *15/00, 7/04, 7/08;* **C12R** *1/91*

U.S. Cl. 435—172.3 **7 Claims**

1. A method of preparing a reassortant virus comprising combining a human non-cultivatable rotavirus with a cultivatable animal rotavirus and producing a reassortant and neutralizing the animal rotavirus with a suitable antibody specific for the 34–38Kd glycoprotein of an animal rotavirus strain.

4,571,386

FELINE INFECTIOUS PERITONITIS VACCINE

Bernard Fishman, 7 Rowlands Close, Gillingham, Kent; Louise M. Hitchcock, 65 Kingswood Ave., Shortlands, Bromley, Kent, and Kevin J. O'Reilly, Lambardes, Drakeley's Field, Milland, Near Liphook, Hants, all of England

Continuation of Ser. No. 98,592, Nov. 29, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 288,269

Claims priority, application United Kingdom, Nov. 30, 1978, 46603/78

Int. Cl.[4] C12N *7/00;* **A61K** *39/12*

U.S. Cl. 435—235 **3 Claims**

1. An attenuated feline infectious peritonitis virus which stimulates production of antibody in susceptible animals, without causing symptoms characteristic of feline infectious peritonitis, which morphalogically resembles a corona virus which is the causative virus of avian infectious bronchitis (AIB), whilst differing from the AIB virus in as much as it is capable of growing in mammalian tissue culture but not in embryonating eggs and which on infecting tissue culture cells causes them to produce irregular shapes, when examined microscopically as wet preparations, and ultimately roundup and/or become detached from the solid surface on which they are growing, said virus resulting from at least 100 passages of a virulent feline infectious peritonitis virus in feline embrionic cell cultures.

4,571,387

BIOLOGICAL-ACID LEACH PROCESS

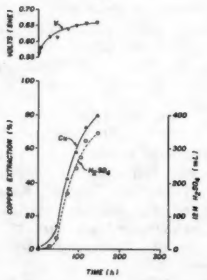
Albert Bruynesteyn, North Vancouver; Ralph P. Hackl, Burnaby; Richard W. Lawrence, and Andrew I. Vizsolyi, both of Vancouver, all of Canada, assignors to British Columbia Research Council, Vancouver, Canada

Filed Mar. 3, 1983, Ser. No. 471,759

Claims priority, application Canada, Jan. 26, 1983, 420245

Int. Cl.[4] B01D *11/00;* **C22B** *3/00*

U.S. Cl. 435—262 **17 Claims**



1. A process for leaching copper from a copper sulphide containing ore, comprising:

(a) contacting the ore with an aqueous acid leaching medium containing sulphide oxidizing bacteria, and a bacterial nutrient; and

(b) maintaining a suitable oxidation potential, and periodically adding a sufficient amount of bacterial compatible acid to the ore and leaching medium mixture, so as to produce elemental sulphur rather than sulphuric acid from sulphide in the ore.

11. A process for leaching copper from a chalcopyrite containing ore, comprising:

(a) grinding the ore to a particle size of less than about 200 mesh;

(b) mixing the ore with an aqueous leaching medium in an amount to obtain a mixture having 2% to 60% by weight of the ore, the leaching medium being acidified with sulphuric acid to a pH between about 1.5 and 3.0, and containing *T. ferrooxidans* bacteria, a bacterial nutrient, about 100 to 4,000 mg of dispersed silver per kilogram of chalcopyrite, about 10 to 30g/L dissolved copper, and about 2 to 25g/L thiosulphate;

(c) agitating the ore and leaching medium mixture while simultaneously sparging with carbon dioxide enriched air;

(d) maintaining the temperature between about 10° C. and 40° C., and the oxidation potential between about 0.54 to 0.66 volts, and periodically adding a sufficient amount of sulphuric acid to the mixture to maintain the pH between 1.5 and 3.0, so as to produce elemental sulphur rather than sulphuric acid from sulphide in the ore.

4,571,388

DETECTION OF RETICULOCYTES

James P. O'Connell, 1909 White Plains Rd., Chapel Hill, N.C. 27514, and Burton H. Sage, Jr., 8404 Lakewood Dr., Raleigh, N.C. 27612, assignors to Becton Dickinson and Company, Paramus, N.J.

Filed Jan. 24, 1983, Ser. No. 460,144
Int. Cl.[4] G01N *1/30*
U.S. Cl. 436—63 7 Claims

1. A process for determining reticulocytes, comprising:
staining reticulocytes with thioflavin T; and detecting the reticulocytes stained with thioflavin T.

4,571,389

RICE HULL ASH COMPOSITIONS

John D. Goodwin, Shreveport, and Forrest W. Mulkey, III, Plain Dealing, both of La., assignors to Molly Maguire, Inc., Shreveport, La.

Continuation-in-part of Ser. No. 460,679, Jan. 24, 1983, Pat. No. 4,488,908. This application Feb. 13, 1984, Ser. No. 579,465
Int. Cl.[4] C04B *21/00, 31/02, 35/14*
U.S. Cl. 501—85 7 Claims

1. A rice hull ash composition comprising
(a) from about 45% to about 70% by weight of substantially water free rice hull ash which contains no more than about 4% carbon;
(b) from about 10% to about 25% of an alkali metal hydroxide;
(c) from about 2% to about 4% boric acid; and
(d) from about 10% to about 25% by weight of water.

4,571,390

SUBSTRATE CAPABLE OF ADSORBING PROTEIN

Teruo Sakagami; Masuhiro Shoji; Noriyuki Arakawa, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 456,847, Jan. 10, 1983, abandoned. This application May 8, 1984, Ser. No. 608,280
Claims priority, application Japan, Jan. 13, 1982, 57-3940
Int. Cl.[4] B01J *20/26*
U.S. Cl. 502—402 18 Claims

1. A porous substrate capable of absorbing protein, having an exclusive molecular weight of at least 30,000 having a hydrophilic outer surface and a hydrophobic pore surface which substrate comprises a cross-linked copolymer having methylol groups, produced by subjecting a monomeric mixture of at least one monomer selected from styrene, alpha-methylstyrene and chloromethylstyrenes and a cross-linking agent copolymerizable with the monomer to suspension copolymerization in an aqueous solution of 5 to 60 parts by weight of the water-soluble high polymeric substance per 100 parts by weight of the monomeric mixture of the monomer and the cross-linking agent in the presence of a pore-regulator, and introducing methylol groups into the resultant cross-linked copolymer.

4,571,391

CHROMIUM ACETYLACETONATE AS A DIETARY SUPPLEMENT AND PHARMACEUTICAL AGENT

Dennis P. Riley; Mark M. Anderson, both of Cincinnati, and John T. Rotruck, Oxford, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 21,382, Mar. 19, 1979, abandoned. This application Nov. 7, 1980, Ser. No. 205,042
Int. Cl.[4] A61K *37/26*
U.S. Cl. 514—4 3 Claims

1. A parenterally administerable composition of matter, comprising a mixture of:
(a) chromium (III) tris-acetylacetonate; and
(b) insulin, in an amount sufficient to maintain blood glucose at desired levels.

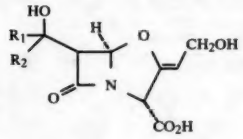
4,571,392

6-SUBSTITUTED DERIVATIVES OF CLAVULANIC ACID

Thomas T. Howarth, Reigate, and King Luk, Cranleigh, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 907,570, May 19, 1978, abandoned. This application Apr. 20, 1982, Ser. No. 370,081
Claims priority, application United Kingdom, May 19, 1977, 21022/77
Int. Cl.[4] C07D *448/04;* A61K *31/42*
U.S. Cl. 514—210 30 Claims

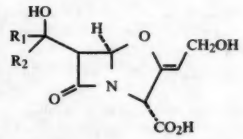
1. A compound of the formula (II):



(II)

or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen and R_2 is ethyl.

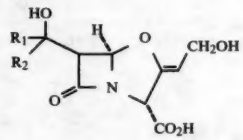
8. The lithium salt of a compound of the formula (II):



(II)

wherein R_1 is hydrogen and R_2 is ethyl.

11. A pharmaceutical composition useful for effecting β-lactamase inhibition in humans and animals which comprises β-lactamase inhibitory amount of a compound of the formula (II):



(II)

or a pharmaceutically acceptable salt thereof wherein R_1 is hydrogen and R_2 is ethyl, in combination with a pharmaceutically acceptable carrier.

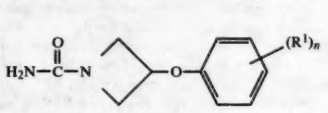
4,571,393

3-PHENOXY-1-AZETIDINECARBOXAMIDES

Lina C. Teng, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Continuation-in-part of Ser. No. 409,476, Aug. 19, 1982, abandoned. This application Oct. 23, 1984, Ser. No. 664,036
Int. Cl.[4] C07D *205/04;* A61K *31/395*
U.S. Cl. 514—210 3 Claims

1. A method of treatment for anticonvulsant effect which comprises orally administering to a mammal an effective amount of a compound selected from the group consisting of 3-phenoxy-1-azetidinecarboxamides having the formula:



wherein;

R^1 is selected from the group consisting of hydrogen, fluoro, loweralkyl, loweralkoxy, trifluoromethyl, acetyl, or aminocarbonyl; and

n is selected from 1 to 3 inclusive wherein R^1 may be the same or different.

4,571,394

HETEROCYCLIC DERIVATIVES

Roger Hayes; David E. Bays, and John W. M. MacKinnon, all of Hertfordshire, United Kingdom, assignors to Glaxo Group Limited, London, England

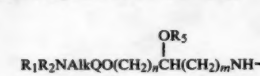
Filed Jul. 23, 1982, Ser. No. 401,402

Claims priority, application United Kingdom, Jul. 24, 1981, 8122875; Feb. 16, 1982, 8204484

Int. Cl.[4] C07D *249/14;* A61K *31/41*

U.S. Cl. 514—212 **9 Claims**

1. A compound of the formula (I)



(I)

and physiologically acceptable salts and hydrates thereof, in which

R_1 represents hydrogen, C_{1-14} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, ar C_{1-6} alkyl, trifluoro C_{1-6} alkyl, heteroaralkyl, or C_{1-6} alkyl substituted by C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino or di C_{1-6} alkylamino;

R_2 represents hydrogen or a C_{1-4} alkyl group;

or R_1 and R_2 together with the nitrogen atom to which they are attached, form piperidino, morpholino, 4-methylpiperidino, pyrrolidino, hexamethyleneimino or tetrahydropyridino;

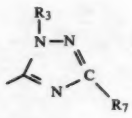
Alk represents a straight or branched alkylene chain of 1 to 3 carbon atoms;

Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_5 represents hydrogen or C_{1-4} alkanoyl;

n and m which may be the same or different, are each 1 or 2;

Z represents



wherein R_3 represents C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, hydroxy C_{2-6} alkyl, C_{1-6} alkoxy C_{2-6} alkyl or C_{1-4} alkanoyloxy C_{2-6} alkyl;

R_7 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, acyloxy C_{1-6} alkyl, C_{1-6} alkylthio C_{1-6} alkyl, arylthio C_{1-6} alkyl, aryloxy C_{1-6} alkyl, ar C_{1-6} alkyloxy C_{1-6} alkyl, or the group $(CH_2)_q R_6$ where q is zero, 1, 2, 3, 4, 5 or 6 and the alkylene chain $(CH_2)_q$ may be straight or branched, and

R_6 is hydroxy, C_{1-6} alkoxy, nitro, heteroaryl, tetrahydropyranyloxy, $CH_2NHC(=X)NHR_9$ wherein X represents NCN, NSO_2 methyl, NSO_2 phenyl or $CHNO_2$; and R_9 is C_{1-6} alkyl;

or R_6 is the group $NR_{10}R_{11}$, where R_{10} is hydrogen or alkyl; and R_{11} is hydrogen, alkyl, alkenyl, aryl, aralkyl, or heteroaralkyl, or R_{11} is the group SO_2R_{12} where R_{12} is alkyl or aryl; or R_{11} is the group COR_{13} where R_{13} is hydrogen, alkyl, aryl, aralkyl, alkoxy, halomethyl, heteroaryl, heteroaralkyl or the group NHR_{14} where R_{14} is hydrogen, alkyl, cycloalkyl, aryl or aralkyl; or R_{10} and R_{11} together represent the group $=CR_{15}R_{16}$ where R_{15} represents aryl or heteroaryl and R_{16} represents hydrogen or alkyl;

or R_6 is the group SO_2R_{17} in which R_{17} is hydroxy, alkyl, aryl or the group $NR_{18}R_{19}$ where R_{18} and R_{19}, which may be the same or different, each represents hydrogen or alkyl;

or R_6 is the group COR_{20} where R_{20} is hydrogen, hydroxy, alkoxy, aryloxy, aralkyloxy, alkyl, aryl, aralkyl or the group $NR_{21}R_{22}$ where R_{21} is hydrogen, alkyl, or alkyl substituted by a hydroxy or alkoxy group; and R_{22} is hydrogen, alkyl, or alkyl substituted by a hydroxy or alkoxy group, alkenyl, aryl, aralkyl or cycloalkyl, or $NR_{21}R_{22}$ forms a 5 to 8 membered ring which may contain oxygen, or a double bond and/or may be substituted by hydroxy or one or two C_{1-3} alkyl groups; or R_6 is the group $CR_{23}{=}NR_{24}$ where R_{23} is hydrogen, alkyl, aryl or aralkyl and R_{24} is hydroxy, alkoxy, aralkyloxy or $-NHC(=Y)NH_2$ where Y is oxygen or suplhur;

with the proviso that when the group R_6 contains a carbon atom through which it is linked to the alkylene group $(CH_2)_q$ then the total number of carbon atoms in the resulting chain is not greater than 6;

wherein unless specifically defined hereinbefore, alkyl as a group or part of a group, represents a straight chain C_{1-6} alkyl group or a branched chain C_{1-6} alkyl group, alkenyl represents a C_{3-6} alkenyl group; alkynyl represents a C_{3-6} alkynyl group; cycloalkyl represents a C_{3-8} cycloalkyl group; halomethyl represents a mono-, di- or trihalo substituted methyl group; aryl as a group or part of a group represents phenyl or phenyl substituted with one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; the acyl portion of an acyloxyalkyl group represents an aroyl group, an aralkanoyl group or C_{1-6} alkanoyl group; heteroaryl as a group or part of a group represents a 5 or 6 membered monocyclic ring containing from 1 to 3 heteroatoms selected from oxygen, nitrogen and sulphur; and the heteroaryl ring may be unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy C_{1-6} alkyl, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di C_{1-6} alkylamino C_{1-6} alkyl or halogen; and the alkyl portion of a heteroaralkyl group is a straight or branched C_{1-4} alkyl chain, and the heteroaryl ring is linked to the alkyl portion through a carbon atom.

4,571,395

LORAZEPAM AND BUPROPION, COMPOSITIONS AND METHODS

Anthony W. Peck, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 226,256, Jan. 19, 1981, abandoned. This application Aug. 24, 1984, Ser. No. 644,145

Claims priority, application United Kingdom, Jan. 21, 1980, 8001910

Int. Cl.[4] A61K *31/55, 31/135*

U.S. Cl. 514—221 **5 Claims**

1. The method of preventing drowsiness caused by lorazepam in a human being treated with lorazepam which comprises the administration to said human of a drowsiness preventing amount of m-chloro-α-t-butylaminopropiophenone or a pharmaceutically and pharmacologically acceptable salt thereof.

4,571,396

ANTIBACTERIAL AGENTS

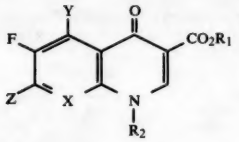
Marland P. Hutt, Saline; Thomas F. Mich, and Townley P. Culbertson, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 600,934, Apr. 16, 1984, abandoned. This application Mar. 11, 1985, Ser. No. 708,565

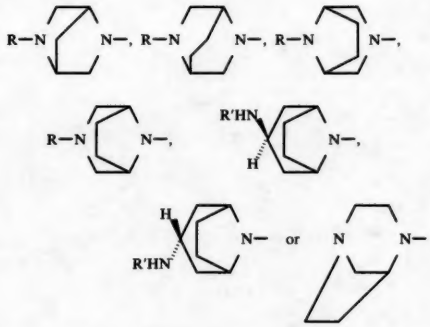
Int. Cl.[4] A61K *31/47, 31/495;* C07D *471/04, 471/08*

U.S. Cl. 514—249 **32 Claims**

1. A compound of the formula:



wherein Z is



in which R is hydrogen, aklyl of one to three carbon atoms, hydroxyalkyl of two or three carbon atoms, benzyl, or p-amino-benzyl; R^1 is hydrogen or alkanoyl of from one to three carbon atoms; X is CH, CF, or N; Y is hydrogen, fluoro, or amino; R_1 is hydrogen, alkyl having from one to six carbon atoms or a cation; R_2 is alkyl having from one to four carbon atoms, vinyl haloalkyl, hydroxyalkyl having from two to four carbon atoms or cycloalkyl having three to six carbon atoms, or a pharamaceutically acceptable acid addition or base salt thereof.

31. A pharmaceutical composition comprising an antibacterially effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

4,571,397

PYRIDAZINONE DERIVATIVES, PREPARATION THEREOF, AND AGRICULTURAL AND HORTICULTURAL FUNGICIDAL, INSECTICIDAL, ACARICIDAL, NEMATICIDAL COMPOSITIONS CONTAINING SAID DERIVATIVES

Masakazu Taniguchi; Masatoshi Baba, both of Funabashi; Yoshinori Ochiai, Shiraoka; Masayoshi Hirose, Shiraoka, and Kiminori Hirata, Shiraoka, all of Japan, assignors to Nissan Chemical Industries, Tokyo, Japan

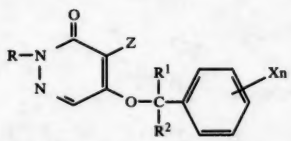
Filed Feb. 17, 1983, Ser. No. 467,259

Claims priority, application Japan, Mar. 5, 1982, 57-34991; Aug. 27, 1982, 57-149446; Oct. 18, 1982, 57-182499; Nov. 25, 1982, 57-206438

Int. Cl.[4] **C07D** *237/06;* **A61K** *31/50*

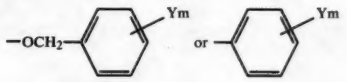
U.S. Cl. 514—252 **33 Claims**

1. A compound of the formula I:



(I)

wherein, R denotes an C_1 to C_6 alkyl, R^1 and R^2 denote each independently hydrogen or a C_1 to C_6 alkyl, X denotes hydrogen, a C_1 to C_6 alkyl, a halogen, a C_1 to C_6 alkoxy, a C_1 to C_6 haloalkyl, a C_1 to C_6 haloalkoxy, C_5 to C_6 cycloalkyl, trimethylsilyl ($—Si(CH_3)_3$),



(wherein Y denotes hydrogen, a halogen, a C_1 to C_6 alkyl, a C_1 to C_6 alkoxy, a C_1 to C_6 haloalkyl, a C_1 to C_6 haloalkoxy or a cycloalkyl, and m is an integer of 1 to 5), n is an integer of 1 to 5, and Z denotes a halogen; said X being the same or different when n is 2 or more, the alkyls and the alkyl moieties contained in the groups being straight or branched, and the halogen itself or the halogen contained in the groups being selected from fluorine, chlorine, bromine or iodine or a mixture thereof.

4,571,398

CYTOSINE DERIVATIVES HAVING HISTAMINE H_2-ANTAGONIST ACTIVITY

Thomas H. Brown, Tewin, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

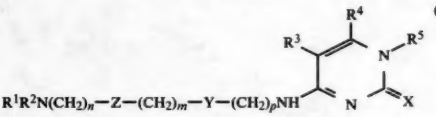
Filed Jun. 20, 1984, Ser. No. 622,411

Claims priority, application United Kingdom, Jul. 9, 1983, 8318638

Int. Cl.[4] **A61K** *31/505;* **C07D** *401/12*

U.S. Cl. 514—259 **21 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 are independently hydrogen, C_{1-6}alkyl, phenyl(C_{1-6})alkyl, furanyl(C_{1-6})alkyl, thienyl(C_{1-6})alkyl C_{3-10}cycloalkyl, hydroxy(C_{2-6})alkyl, halo(C_{2-6})alkyl (wherein said hydroxy and halo groups are not substituted on the carbon atom adjacent to the nitrogen atom); or

R^1 and R^2 together represent $—(CH_2)_q—$ wherein q is 4 to 7 to form together with the nitrogen atom to which they are attached a 5–8 membered saturated ring;

n is an integer from 1 to 6;

Z is 2,5-furanyl, 2,5-thienyl, 2,4-pyridyl wherein the $R^1R^2N(CH_2)_n$ group is in the 4-position, or 1,3- or 1,4-phenylene;

m is one; or if Z is pyridyl or phenylene m may also be zero;

Y is oxygen, sulphur or methylene; or if Z is furanyl or thienyl Y may also be a bond;

p is two, three or four;

X is oxygen or sulphur; and

R^3, R^4 and R^5 independently represent hydrogen or C_{1-6}alkyl, or R^3 and R^4 together represent a butadien-1,4-diyl moiety (to form together with the carbon atoms to which they are attached a benzene ring) optionally substituted by C_{1-6}alkyl.

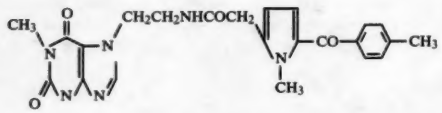
21. A method of blocking histamine H_2-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim **1**.

4,571,399
7-(1-METHYL-5-P-METHYLBENZOYLPYRROLE-2-ACETAMIDOETHYL)-THEOPHYLLINE WITH ANTI-PLATELET AGGREGANT AND BRONCHOLYTIC ACTIVITY

Alessandro Baglioni, Rome, Italy, assignor to Medosan Industrie Biochimiche Riunite S.p.A., Rome, Italy

Filed Jul. 26, 1984, Ser. No. 634,494
Claims priority, application Italy, Jul. 29, 1983, 48782 A/83
Int. Cl.[4] A61K *31/52;* **C07D** *473/08*
U.S. Cl. 514—265 **3 Claims**

1. 7-(1-Methyl-5-p-methylbenzoylpyrrole-2-acetamidoethyl)theophylline of formula:



3. The method of using the compound of claim **1** as an anti-platelet aggregant agent by administering an anti-platelet aggregant effective amount to an animal in need thereof.

4,571,400
DIHYDROCODEINE/IBUPROFEN PHARMACEUTICAL COMPOSITIONS AND METHOD

John D. Arnold, Kansas City, Mo., assignor to Belleview Pharmaceutical, Inc., Kansas City

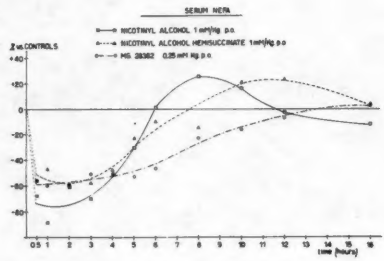
Filed Dec. 18, 1984, Ser. No. 682,902
Int. Cl.[4] A61K *31/19, 31/44*
U.S. Cl. 514—282 **6 Claims**

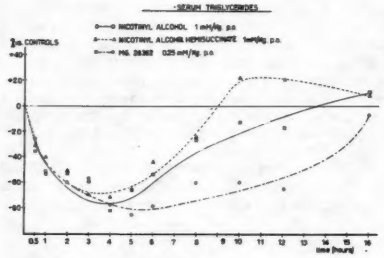
1. A process for treating pain in a mammal which comprises administering to the mammal an amount of a pharmaceutical composition effective to provide an analgesic effect said pharmaceutical composition comprising dihydrocodeine or a pharmaceutically acceptable acid addition salt thereof and ibuprofen or a pharmaceutically acceptable acid addition salt thereof, the ratio of dihydrocodeine to ibuprofen being within the range that the administration of a therapeutic amount of said composition to a mammal will provide a greater analgesic effect than the effect obtainable by use of either dihydrocodeine or a pharmaceutically acceptable acid addition salt thereof or ibuprofen or a pharmaceutically acceptable acid addition salt thereof alone.

4,571,401
3-PYRIDINE ACETIC AND 3-(3-PYRIDYL-METHOXYCARBONYL)-PROPIONIC ACID PANTETHEINE AND PANTETHEINE ESTERS HAVING HYPOLIPEMIC ACTIVITIES

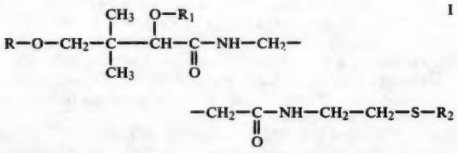
Giampaolo Picciola, Milan; Piergiorgio Gentili, Treviglio; Franco Ravenna, and Mario Riva, both of Monza, all of Italy, assignors to Maggioni Farmaceutici S.p.A., Milan, Italy

Filed Jul. 10, 1984, Ser. No. 629,512
Claims priority, application United Kingdom, Jul. 19, 1983, 8319457; Dec. 14, 1983, 8333302
Int. Cl.[4] C07D *213/55, 401/12, 401/14;* **A61K** *31/44*
U.S. Cl. 514—332 **8 Claims**


SERUM HDL
NICOTINYL ALCOHOL 1 mM/kg p.o.
NICOTINYL ALCOHOL HEMISUCCINATE 1 mM/kg p.o.
MS. 28362 0.25 mM kg p.o.
% vs CONTROLS
time (hours)

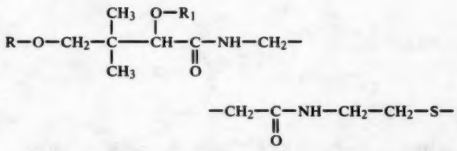


1. A compound of the formula



I

wherein R, R_1 and R_2 each represent a member of the group consisting of hydrogen, 3-pyridineacetyl and 3-(3-pyridylmethoxycarbonyl)-propionyl, with the proviso that R, R_1 and R_2 do not all simultaneously represent hydrogen; and R_2 may also represent a group



wherein R and R_1 have the foregoing meaning, with the pro-

viso that for each individual compound the meaning of R and R_1 is the same as in the formula I; and the non-toxic acid addition salts thereof.

6. A method for treating hypercholesteremia, which comprises administering orally or parenterally to a human subject the compound of claim 1 in a pharmaceutically acceptable dosage unit form, said dosage ranging between 0.05 and 2.0 grams with a daily dosage ranging between 0.1 and 10.0 g.

4,571,402

ANTI-BRONCHOCONSTRICTION 2-(4'-PYRIDINYL)-THIAZOLE DERIVATIVES, COMPOSITION, AND METHOD OF USE THEREFOR

Brooks R. Sunday, Oakland, and Joseph T. Witkowski, Morris Township, Morris County, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

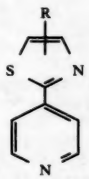
Continuation-in-part of Ser. No. 391,061, Jun. 22, 1982. This application May 9, 1983, Ser. No. 492,848

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] A01N *43/40*; A61K *31/44*; C07D *417/04*

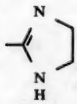
U.S. Cl. 514—336 **6 Claims**

1. A compound having the structural formula I



wherein

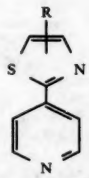
R is cyano,



—C(=X)NHY wherein X is O, S or NH; and

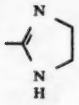
Y is hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, or hydroxyalkyl having from 1 to 6 carbon atoms, and the pharmaceutically acceptable salts thereof; provided that N-methyl-2-(4'-pyridinyl)-thiazole-4-carboxamide ,2-(4'-pyridinyl)-thiazole-4-carboxamide, and 4-cyano-2-(4'-pyridinyl)-thiazole are excluded.

6. A method for treating bronchoconstriction in a mammal which comprises administering an antibronchoconstrictionally effective amount of a compound having structural formula I



in combination with a pharmaceutically acceptable carrier, wherein

R is cyano,



or —C(=X)NHY wherein X is O, S or NH; and

Y is hydrogen, hydroxy, alkyl having from 1 to 6 carbon atoms, or hydroxyalkyl having from 1 to 6 carbon atoms, and the pharmaceutically acceptable salts thereof; provided that N-methyl-2(4'-pyridinyl)-thiazole-4-carboxamide is excluded.

4,571,403

ANTIANGINAL MEDICATED COMPOUND

Irina E. Zimakova; Dania A. Valimukhametova; Irina V. Zaikonnikova; Vladimir F. Bogoyavlensky, all of Kazan; Natalya V. Kaverina, Moscow; Roman A. Kamburg; Anatoly M. Karpov, both of Kazan; Lenor I. Khmelnitsky, Moscow; Oleg V. Lebedev, Moscow; Lia V. Epishina, Moscow; Lidia V. Lapshina, Moskovskaya; Ljudmila I. Suvorova; Nikolai V. Darinsky, both of Moscow, all of U.S.S.R., and Sergei S. Novikov, deceased, late of Moscow, U.S.S.R. (by Valentina V. Sevostyanova, Alexandr S. Novikov, Sergei S. Novikov, administrators), assignors to Institut Organicheskoi Khimii Imeni N.D. Zelinskogo Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Dec. 6, 1984, Ser. No. 678,698

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—387 **4 Claims**

1. A method for the treatment of patients suffering from ischemic heart disease comprising administering to said patient an effective amount of 2,4,6,8-tetramethyl-2,4,6,8 tetraazobicyclo-(3,3,0)-octanedion-3,7.

4,571,404

SUBSTITUTED BENZOPENTATHIEPINS

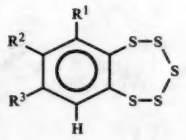
Bertrand L. Chenard, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 502,231, Jun. 8, 1983, abandoned. This application Jun. 7, 1984, Ser. No. 618,445

Int. Cl.[4] C07D *341/00*; A01N *43/24*

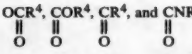
U.S. Cl. 514—431 **20 Claims**

1. A benzopentathiepin compound of the formula



wherein

R^1, R^2, and R^3 are the same or different and are selected from H (provided that no more than two of R^1, R^2, and R^3 are H), X, CX_3, NO_2, SR^4, OR^4, $NR^4{}_2$,



R^4 is selected from substituted and unsubstituted branched or straight chain C_1 to C_6 alkyl, wherein the substituents on substituted R^4 alkyl groups are selected from X, CX_3, OR, SR,

and COOR, wherein R is C_1 to C_4 straight or branched alkyl; and

X is selected from Cl, Br, and F.

4,571,405

ANTI-ALLERGIC CHROMONE- OR THIOCHROMONE-5-OXAMIC ACID DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

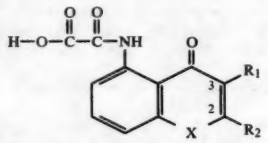
Trevor S. Abram, Marlow; Peter Norman, Slough, and Warren, Brian T., Ickenham, all of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 29, 1984, Ser. No. 615,042

Int. Cl.[4] A61K *31/35, 31/38;* **C07D** *309/38, 335/12*

U.S. Cl. 514—437 **28 Claims**

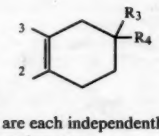
1. A compound of the formula:



or pharmacologically acceptable nontoxic salts thereof wherein:

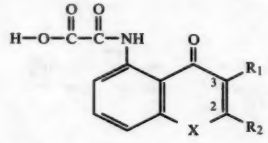
X is selected from the group consisting of —O—, —S—, and $—SO_2—$;

R_1 and R_2 are each independently H or lower alkyl having from 1 to 4 carbon atoms or together with C_2 and C_3 form a cyclohexane ring having the structure:



wherein R_3 and R_4 are each independently H or a lower alkyl having from 1 to 4 carbon atoms.

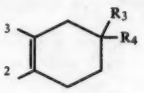
14. A therapeutic method for producing an antiallergic effect in a mammal for whom such therapy is indicated, comprising administering to said mammal an effective antiallergic amount of a compound of the formula:



or pharmacologically acceptable nontoxic salts thereof wherein:

X is selected from the group consisting of —O—, —S—, and $—SO_2—$;

R_1 and R_2 are each independently H or lower alkyl having from 1 to 4 carbon atoms or together with C_2 and C_3 form a cyclohexane ring of the formula:



wherein R_3 and R_4 are each independently H or a lower alkyl having from 1 to 4 carbon atoms.

4,571,406

ANTI-HYPERTENSIVE CHROMANS AND CHROMENES

John M. Evans, Roydon, and Frederick Cassidy, Harlow, both of England, assignors to Beecham Group p.l.c., England

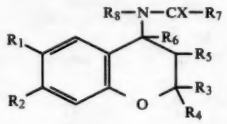
Filed May 16, 1984, Ser. No. 610,623

Claims priority, application United Kingdom, May 18, 1983, 8313687; Dec. 23, 1983, 8334418

Int. Cl.[4] A61K *31/35;* **C07D** *311/02*

U.S. Cl. 514—456 **24 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, 1-mercapto C_{2-7} alkyl, formyl, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino, C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino, or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or $—C(C_{1-6}$ alkyl)NOH or $—C(C_{1-6}$ alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

either R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} carboxylic acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

R_7 is a member selected from the group consisting of phenyl, naphthyl, furanyl, thiophenyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, thiadiazolyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, triazinyl, benzofuranyl, benzothiophenyl, indolyl, indazolyl, quinolinyl, isoquinolinyl or quinazoninyl said member being optionally substituted by one or more substituents selected from the group consisting of C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, C_{1-12} carboxylic acyl, and amino or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl;

R_8 is hydrogen or C_{1-6} alkyl; and

X is oxygen or sulphur; the R_8-N-CX-R_7 group being trans to the R_5 group when R_5 is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy; or a pharmaceutically acceptable salt or solvate thereof.

23. An anti-hypertensive pharmaceutical composition which comprises an anti-hypertensive effective amount of a compound according to claim **1**, or a pharmaceutically acceptable

salt or solvate thereof and a pharmaceutically acceptable carrier.

4,571,407

PHARMACEUTICAL COMPOSITIONS CONTAINING BILOBALID FOR THE TREATMENT OF NEUROPATHIES

Shyam S. Chatterjee; Bernard L. Gabard, both of Karlsruhe, and Hermann E. W. Jaggy, Bad Schönborn, all of Fed. Rep. of Germany, assignors to Dr. Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

Filed Oct. 19, 1984, Ser. No. 662,598

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338995

Int. Cl.[4] A61K *31/36*

U.S. Cl. 514—464 4 Claims

1. A method for the treatment of neuropathic disorders which comprises administering to a patient requiring said treatment bilobalid in an amount sufficient to alleviate the neuropathic disorders.

4,571,408

α,β-DIHYDROPOLYPRENYL DERIVATIVES FOR TREATING HEPATITIS

Isao Yamatsu, Kawaguchi; Yuichi Inai, Tokyo; Shinya Abe, Nakamura; Hideaki Watanabe, Aichi; Toshiji Igarashi, Tokorozawa; Hiroyuki Shiojiri, Sayama; Yoshio Tanabe, Saitama, and Kuniko Hara, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

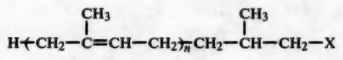
Division of Ser. No. 269,930, May 28, 1981, Pat. No. 4,481,217. This application Oct. 20, 1983, Ser. No. 543,748

Claims priority, application Japan, May 30, 1980, 55-71488; May 30, 1980, 55-71489

Int. Cl.[4] C07C *57/03;* A61K *31/22, 31/23*

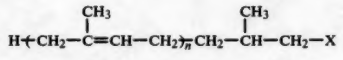
U.S. Cl. 514—546 14 Claims

1. A compound having the formula:



wherein X is —$COOR_1$ or —CH_2OR_2, in which R_1 is hydrogen or alkyl having one to four carbon atoms and R_2 is hydrogen or aliphatic acyl having one to four carbon atoms; and n is an integer of one to four.

8. A pharmacological composition for the treatment of liver hepatitis comprising a therapeutically effective amount of a compound having the formula:



wherein X is —$COOR_1$ or —CH_2OR_2, in which R_1 is hydrogen or a lower alkyl group and R_2 is hydrogen or aliphatic acyl having one to four carbon atoms; and n is an integer of one to four, in combination with a pharmacological carrier.

4,571,409

AMINOPROPANOL DERIVATIVES OF 2-HYDROXY-β-PHENYL-PROPIOPHENONES, THEIR PREPARATION AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Albrecht Franke, Wachenheim; Josef Mueller, Ludwigshafen; Helmut Lietz, Neustadt; Walter-Wielant Wiersdorff, Mutterstadt; Hans-Guenther Hege, Neustadt; Claus D. Mueller, Viernheim; Josef Gries, Wachenheim; Dieter Lenke, Ludwigshafen; Gerda von Philipsborn, Weinheim, and Manfred Raschack, Weisenheim am Sand, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 613,389, May 23, 1984, which is a continuation of Ser. No. 416,228, Sep. 9, 1982, abandoned. This application May 13, 1985, Ser. No. 733,631

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137178; Jul. 17, 1982, 3226863

Int. Cl.[4] A61K *31/135;* C07C *97/10*

U.S. Cl. 514—652 6 Claims

1. 2-(2'-Hydroxy-3'-n-propylamino-propoxy)-β-(3,4-dimethoxyphenyl)-propiophenone or a physiologically acceptable acid addition salt thereof.

2. A therapeutic composition for treating cardiac arrhythmias and cornary insufficiency comprising a pharmaceutical excipient and an effective amount of the aminopropanol derivative of claim 1.

4,571,410

CAULKING COMPOSITION

Norman Nevins, and Thomas L. Gustafson, both of Dayton, Ohio, assignors to Magic Seal Corporation, Dayton, Ohio

Filed Feb. 7, 1985, Ser. No. 699,177

Int. Cl.[4] C08L *23/08;* C08K *5/34, 3/36*

U.S. Cl. 523—122 20 Claims

1. A solvent based, clear caulking composition comprising by weight approximately:

50–60% solvent,

12–37% of a first ethylene vinyl acetate copolymer having a 45–55% vinyl acetate content,

0.6–7.4% of a second ethylene vinyl acetate copolymer having a 20–45% vinyl acetate content,

8–16% water white hydrocarbon resin,

4–6% thickening agent,

0–2.4% plasticizer,

0–2.5% bactericide, and

0–0.25% antioxidant/U.V. light stabilizer.

4,571,411

HYBRID COMPOSITE OF POLY(P-PHENYLENE-TRANS-BISBENZOTHIAZOLE) AND CERAMIC FIBER

Joseph F. Mammone, Cinnaminson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1985, Ser. No. 695,874

Int. Cl.[4] C08K *3/22*

U.S. Cl. 523—457 4 Claims

1. A composite comprising an organic polymer matrix resin reinforced with a combination of aligned continuous filaments of high modulus polycrystalline alumina ceramic fiber and poly(p-phenylene-transbisbenzothiazole) fiber.

4,571,412

AQUEOUS ADHESIVE COMPOSITIONS

Hisatsugu Minamida, Yamatokoriyama; Akira Kato, Nara; Isamu Sawayama, and Ken-ichi Tanaka, both of Hikami, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 29, 1984, Ser. No. 676,403

Claims priority, application Japan, Dec. 9, 1983, 58-233417

Int. Cl.[4] C08J *1/00, 77/00;* C08K *1/00*

U.S. Cl. 524—64 10 Claims

1. An aqueous adhesive composition which comprises 0.5 to

30 parts by weight, as solids, of an aqueous, cationic polyamide polyamine epichlorohydrin resin solution per 100 parts by weight, as solids, of an aqueous, cationic or nonionic polymer dispersion.

4,571,413

PHENOLIC RESIN COMPOSITION

John G. Dolden, Guildford; Sidney G. Fogg, Ashtead, both of England, and Werner A. Lidy, Geneva, Switzerland, assignors to The British Petroleum Company p.l.c., London, England

Filed Feb. 12, 1985, Ser. No. 701,097

Claims priority, application United Kingdom, Feb. 17, 1984, 8404210

Int. Cl.[4] C08L *61/10*

U.S. Cl. 524—199 9 Claims

1. A curable phenolic resin composition comprising:

(A) a major proportion of an aqueous phenolic resole resin, and

(B) a minor proportion of a poly(1,2-alkylene oxide) having terminating groups selected from the group comprising $—NH_2$, $—CONH_2$, $—NH.CO.NH_2$ and $—OCONH_2$.

4,571,414

THERMOPLASTIC MOLDING OF CERAMIC POWDER

Gary M. Renlund, Scotia, and Curtis A. Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,034

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] C04B *35/10, 35/18, 35/56, 35/58*

U.S. Cl. 524—322 36 Claims

1. A thermoplastically moldable ceramic composition consisting essentially of a substantially homogeneous dispersion consisting essentially of from about 40% by volume to about 60% by volume of a densifiable ceramic particulate material having an average particle size which is less than about 10 microns and from about 40% by volume to about 60% by volume of a binder consisting essentially of an organic acid containing from 12 to 26 carbon atoms per molecule and having a melting point ranging from about 44° C. to about 88° C. and a thermoplastic copolymer of ethylene and from greater than about 12 weight % to about 33 weight % vinyl acetate, said copolymer having a melt index ranging from about 8 to about 43, said organic acid ranging from greater than about 18% by weight up to about 45% by weight of the total weight of said binder, said binder having no significant deleterious effect on said densifiable ceramic particulate material, said densifiable ceramic particulate material being selected from the group consisting of densifiable silicon carbide particulate material, densifiable silicon nitride particulate material, densifiable mullite particulate material and densifiable aluminum nitride particulate material.

4,571,415

WASHOUT RESISTANT COATINGS

Arthur D. Jordan, Jr., Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 1, 1984, Ser. No. 656,198

Int. Cl.[4] C08K *3/28*

U.S. Cl. 524—428 11 Claims

1. An improved roof mastic or caulking composition displaying superior washout resistance comprising an aqueous dispersion of water-insoluble latex polymer prepared by emulsion polymerization, pigment dispersed with anionic polymer, and water soluble salt of zinc ammonium complex ion wherein the pigment to binder ratio of said roof mastic is from about 1.0 to 2.5.

4,571,416

LIQUID COLORANT/ADDITIVE CONCENTRATE FOR PLASTICS

Richard E. Jarzombek, Munster, and Raymond J. Moeller, Cedar Lake, both of Ind., assignors to Bee Chemical Co., Lansing, Ill.

Continuation of Ser. No. 544,370, Oct. 21, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,235

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—474 8 Claims

1. A liquid colorant dispersion for plastics comprising:

(a) from about 15 percent to about 90 percent by weight of a colorant;

(b) from about 5 percent to about 50 percent by weight of a polybutene having an average molecular weight between about 1000 and 3500; and

(c) from about 5 percent to about 70 percent by weight of an essentially non-volatile solvent for the polybutene;

wherein the dispersion has a viscosity between about 1,000 and 40,000 centipoises.

4,571,417

LEVELLER-CONTAINING HIGH-SOLIDS POLYURETHANE REACTIVE COATING SYSTEMS AND THEIR USE FOR REACTIVE COATING

Wilhelm Thoma, Leverkusen; Karl H. Pisaric, Pulheim, and Heinrich Alberts, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,283

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239900

Int. Cl.[4] C08L *51/08*

U.S. Cl. 525—63 7 Claims

1. A high-solids polyurethane reactive coating system based on blocked NCO-prepolymers, polyamines and, optionally, solvents, said coating system containing a leveller agent comprising

(1) a combination of from about 1 to 10% by weight of (A vinyl polymers and copolymers based on (meth)acrylic acid esters and, optionally, other vinyl comonomers and from about 0.1 to 2% by weight of (B) polysiloxanes,

(2) from about 0.2 to 2.0% by weight of (C) poly(meth)acrylic acid (hydroxy)alkyl ester graft polymers on mixtures of dimethylpolysiloxanes containing vinyl residues and SiH-containing dimethylpolysiloxanes,

(3) mixtures of (A), (B) and (C) in the amounts specified,

(4) mixtures of (A) and (C) in the amounts specified or

(5) mixtures of (B) and (C) in the amounts specified.

4,571,418

CHAR-FORMING POLYMER, MOLDABLE COMPOSITION AND METHOD

Usama E. Younes, Newtown Square, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

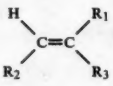
Filed Mar. 12, 1984, Ser. No. 588,428

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—148 19 Claims

5. A moldable composition comprising a thermoplastic resin and a char-forming amount of a char-forming polymer which contains:

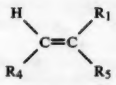
(A) from about 2.5 to about 50 mol percent recurring units of at least one monomer which is capable of undergoing tautomerization and has the general formula:



wherein R_1 represents a hydrogen atom, or a C_1 to C_5 alkyl group; R_2 represents a carboxylic acid group, and amide

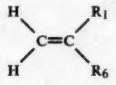
group or a C_1 to C_5 N-mono-or di-substituted amide group; and, wherein R_3 represents an N mono-substituted amide group in which the substituent can be a hydrogen atom, a C_1 to C_5 alkyl group, an aryl group or an amide group;

(B) from about 2.5 to about 50 mol percent recurring units of at least one monomer which is capable of undergoing a nucleophilic substitution reaction by (A) and has the general formula:



wherein R_1, is as defined above; R_4 represents a hydrogen atom; and, R_5 represents a phosphonate or substituted phosphonate group bearing a leaving group or an aryl or substituted aryl group bearing a leaving group; and

(C) from about 0 to about 95 mol percent recurring units of at least one monomer which is copolymerizable with (A) and (B) and has the general formula:



wherein R_1 is as defined above; R_6 represents an aryl or substituted aryl group or

and wherein R_7 represents a C_1 to C_{15} alkyl group or an aryl or substituted aryl group.

4,571,419

BLENDS OF NOVEL POLY(ESTER-CARBONATE)S WITH OTHER POLYMERS

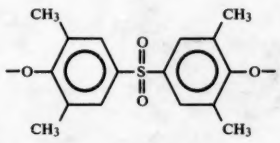
Louis M. Maresca, Belle Mead, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 485,946, Apr. 18, 1983, Pat. No. 4,499,257. This application Feb. 12, 1985, Ser. No. 701,009

Int. Cl.[4] C08G *63/64*

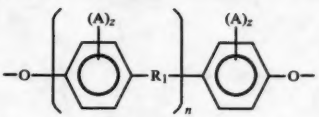
U.S. Cl. 525—177 **8 Claims**

1. A blend containing a polymer selected from the group consisting of an aromatic polycarbonate, a polyester, a polysulfone, a polyarylate, a poly(ether imide), a styrenic polymer or a vinyl chloride containing polymer and a poly(ester-carbonate) resin, said poly(ester-carbonate) consisting essentially of from about 20 weight percent to 100 weight percent of repeating units (I) having the formula



(I)

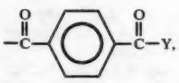
and from 0 weight percent to about 80 weight percent of repeating units (II) having the formula



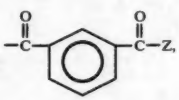
(II)

wherein A is selected from alkyl groups of 1 to 4 carbon atoms, chlorine or bromine, each z, independently, has a value of from 0 to 4 inclusive, n has a value of 0 or 1, and R_1 is a divalent saturated or unsaturated aliphatic hydrocarbon radical, or a cycloalkylidene or cycloalkylene radical having up to and including 9 carbon atoms, O, CO, SO_2, S or a direct bond, with the proviso that when R_1 is SO_2, then repeating unit (II) is not the same as repeating unit (I); the repeating units (I) and the repeating units (II) are connected by interbonding units, X units of the formula:

and one or more of Y units of the formula:



and Z units of the formula:



wherein the mole ratio of X units to the combination of one or more Y and Z units is about 0.25 to 9.

4,571,420

QUICK-CURE, FLEXIBLE POLYMER COMPOSITION

Allen P. Marks, Richboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 17, 1984, Ser. No. 581,466

Int. Cl.[4] C08F *3/64, 3/66, 3/68*

U.S. Cl. 525—350 **14 Claims**

1. A composition which remains flexible when cured comprising polymer backbone formed from one or more monomers selected from the group consisting of acrylic and methacrylic esters, acids, and nitriles; styrenes; vinyl halides; vinyl acetate; and butadienes, said polymer containing pendant unsaturation and having a T_g below about 0° C.; at least about 0.3 equivalents of polyfunctional mercaptans per equivalent of unsaturation in said composition; and vanadium compound providing about 0.001 to about 0.15% by weight vanadium.

4,571,421

MAMMALIAN GENE FOR MICROBIAL EXPRESSION

Keiichi Itakura, Arcadia, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

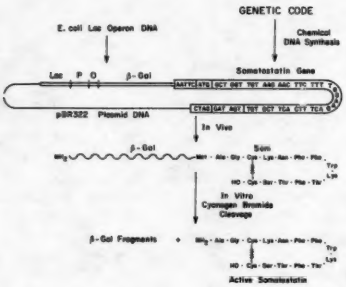
Division of Ser. No. 91,334, Nov. 5, 1979, Pat. No. 4,356,270, which is a continuation-in-part of Ser. No. 849,691, Nov. 8, 1977, abandoned. This application Jul. 30, 1982, Ser. No. 403,599

Int. Cl.[4] C07H *15/12;* **C12N** *15/00*

U.S. Cl. 536—27 **2 Claims**

1. A double-stranded polydeoxyribonucleotide having cohesive termini each comprising one strand of a double-strand

restriction endonuclease recognition site and, between the termini, a structural gene coding for the expression of a mam-



malian polypeptide, at least a majority of the codons in the coding strand of said gene being codons preferred for the expression of microbial genomes.

4,571,422

POLYMER SUSPENSIONS

Ken C. Symes, Keighley; John Langley, Shipley, and Peter Flesher, Bingley, all of United Kingdom, assignors to Allied Colloids Limited', England

Continuation-in-part of Ser. No. 552,591, Nov. 16, 1983, abandoned. This application May 14, 1984, Ser. No. 609,681

Claims priority, application United Kingdom, May 17, 1983, 8313521; Sep. 23, 1983, 8325503; Dec. 23, 1983, 8334313

Int. Cl.[4] C08B *37/00*

U.S. Cl. 536—114 **22 Claims**

1. A method of making a composition containing microbial polysaccharide that has been made by fermentation in a fermentation broth, the method comprising emulsifying a viscous aqueous solution of the microbial polysaccharide and selected from the fermentation broth and concentrates thereof and having a consistency index of above 25,000 cps into an oil in the presence of a water-in-oil emulsifying agent having HLB below 11 to form a water-in-oil emulsion containing from 25 to 80% by weight of the said aqueous solution and drying the product to reduce the water content based on water plus microbial polysaccharide, to below 50% by weight and to a microbial polysaccharide content of above 25% by weight.

4,571,423

SUBSTITUTED 5-AMINOMETHYL-2-ACYLAMINOPYRROLO[2,3-D]PYRIMIDIN-4-ONES

Hiroaki Nomura, Osaka, and Hiroshi Akimoto, Hyogo, both of Japan, assignors to Takeda Chemical Industries Ltd., Osaka, Japan

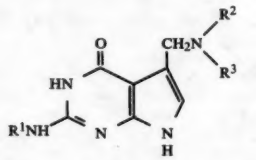
Filed Mar. 16, 1983, Ser. No. 475,962

Claims priority, application Japan, Mar. 16, 1982, 57-41910

Int. Cl.[4] C07D *487/04, 413/06;* **A61K** *31/505, 27/00*

U.S. Cl. 544—280 **8 Claims**

1. A 7-deazapurine compound of the formula:

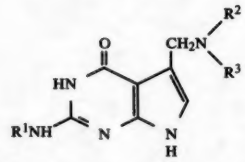


wherein R^1 is an alkanoyl group having 1 to 18 carbon atoms, a benzoyl, toluoyl, naphthoyl, phenylacetyl, or cinnamoyl group, each of R^2 and R^3 is an alkyl group of 1 to 10 carbon atoms, alkenyl group of 3 to 13 carbon atoms or an aralkyl group of the class consisting of benzyl, phenethyl, phenylpropyl, naphthylmethyl, and naphthylethyl, or wherein NR^2R^3 forms a cyclic amino group of the class consisting of 1-pyrrolidinyl, 1-pyrrolinyl, 1-imidazolidinyl, 1-imidazolinyl, 1-pyrazolidinyl, 1-pyrazolinyl, morpholino, piperidino, and 1-piperazinyl,

and wherein the said alkyl group, alkenyl group, aralkyl group and cyclic amino group may have at a position or positions other than the α-position one to four substituents selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, an alkanoyl group of 1 to 4 carbon atoms, hydroxy, nitro, halogen, cyano, trifluoromethyl, a dialkylamino group of 2 to 8 carbon atoms, and an alkanoylamido group of 1 to 4 carbon atoms,

or a pharmaceutically acceptable salt thereof.

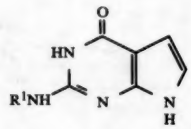
6. A method of producing 7-deazapurine compound of the formula:



wherein R^1 is an alkanoyl group having 1 to 18 carbon atoms, a benzoyl, toluoyl, naphthoyl, phenylacetyl, or cinnamoyl group, each of R^2 and R^3 is an alkyl group of 1 to 10 carbon atoms, alkenyl group of 3 to 13 carbon atoms or an aralkyl group of the class consisting of benzyl, phenethyl, phenylpropyl, naphthylmethyl, and naphthylethyl, or wherein NR^2R^3 forms a cyclic amino group of the class consisting of 1-pyrrolidinyl, 1-pyrrolinyl, 1-imidazolidinyl, 1-imidazolinyl, 1-pyrazolidinyl, 1-pyrazolinyl, morpholino, piperidino, and 1-piperazinyl,

and wherein the said alkyl group, alkenyl group, aralkyl group and cyclic amino group may have at a position or positions other than the α-position one to four substituents selected from the group consisting of an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, an alkanoyl group of 1 to 4 carbon atoms, hydroxy, nitro, halogen, cyano, trifluoromethyl, a dialkylamino group of 2 to 8 carbon atoms and an alkanoylamido group of 1 to 4 carbon atoms, or a pharmaceutically acceptable salt thereof,

which comprises subjecting a compound of the formula



wherein R^1 has the same meaning as defined above, and a compound of the formula:

wherein R^2 and R^3 have the same meaning as defined above,

to Mannich condensation reaction in the presence of a formaldehyde compound.

4,571,424

OPTICAL RESOLUTION OF RACEMIC FEMOXETINE

Jorgen A. Christensen, Virum, and Peer Everland, Bagsvaerd, both of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Filed Feb. 29, 1984, Ser. No. 584,721
Claims priority, application Denmark, Mar. 7, 1983, 1115/83
Int. Cl.[4] C07D *211/22*
U.S. Cl. 546—236 10 Claims

1. A process for the optical resolution of a mixture of the (+) and (−) enantiomers of trans-3-[(4-methoxyphenoxy)-methyl]-1-methyl-4-phenylpiperidine, characterized in reacting said mixture of the (+) and (−) enantiomers of trans-3-[(4-methoxyphenoxy)-methyl]-1-methyl-4-phenylpiperidine with less than the stoichiometric amount of the (+) enantiomer of mandelic acid or a 4-halo derivative thereof in an organic solvent from which the (+) (+) enantiomer precipitates to form two diastereomeric compounds, precipitating the (+) (+) diastereomeric compound from said solvent, and converting said precipitated compound into the free (+)-trans-3-[(4-methoxyphenoxy)-methyl]-1-methyl-4-phenylpiperidine or a pharmaceutically-acceptable salt thereof.

4,571,425

METHOD FOR MAKING AROMATIC BIS(ETHER ANHYDRIDE)

James M. Silva, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,833
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—241 4 Claims

1. A process for making aromatic bis(ether anhydride) which comprises

(1) effecting an imide-anhydride exchange in an equilibration reactor between aromatic bisimide and phthalic anhydride in the presence of an imide-anhydride exchange catalyst and water resulting in the production of an equilibration mixture comprising an aromatic bis(ether anhydride) and phthalimide melt,

(2) feeding the equilibration mixture of (1) to a stripper-reactor,

(3) effecting the separation of phthalimide from aromatic bis(ether anhydride) in the stripper-reactor with a mixture of water and exchange catalyst maintained in the vaporous state at a temperature of from about 150° C. to 250° C.,

(4) recovering the phthalimide from (3) as an aqueous mixture consisting essentially of phthalimide, water and exchange catalyst,

(5) recovering phthalimide from the mixture of (4) and recycling water and exchange catalyst to the equilibration reactor and the stripper-reactor,

(6) recovering a mixture comprising aromatic bis-(ether anhydride) from the stripper-reactor as an aqueous melt,

(7) conveying the aqueous melt of (6) to a separator selected from the class consisting of a thin film evaporator, a wiped film evaporator and a rotary evaporator to provide for the recovery of the aromatic bis(ether anhydride) and

(8) recycling the resulting mixture comprising water, phthalic anhydride and exchange catalyst to the equilibration reactor.

4,571,426

PROCESS FOR THE PRODUCTION OF MALEIC ANHYDRIDE

Fritz Gude, Herne, and Ferdinand von Praün, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls AG, Marl, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,155
Int. Cl.[4] C07D *307/60*
U.S. Cl. 549—257 10 Claims

1. A process for the production of maleic anhydride by catalytic air oxidation of hydrocarbons capable of being so oxidized at a temperature in the range of 300°–450° C., which, after air oxidation, comprises:

(a) introducing the air stream containing maleic anhydride and water vapor

(i) at a temperature below the dew point of the accompanying water, into a water-insoluble tertiary amine extracting agent, which is stable to air, and a hydrocarbon diluent entrainer for the water; and separating the formed organic layer; or

(ii) at a temperature above the dew point of the accompanying water, into a mixture of a water-insoluble tertiary amine extracting agent, which is stable to air, and a high-boiling alcohol; and separating the formed organic layer; or

(iii) into water; and extracting the maleic acid with a water-insoluble tertiary amine extracting agent, which is stable or unstable to air, and a hydrocarbon diluent entrainer for the water; and separating the formed organic layer; and

(b) heating the extract obtained according to step (a) to a temperature in the range of 120°–180° C. in vacuo, thereby recovering the maleic anhydride; and wherein said water-insoluble tertiary amines have a pKa value <9, and wherein said tertiary amines, for steps (a)(i) and (a)(ii) have branched primary aliphatic side chains in the 2-position.

4,571,427

METHOD OF PREPARING 2-CHLOROETHYLDICHLOROSILANES

Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf Köln, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,770
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331372
Int. Cl.[4] C07F *7/08, 7/12, 7/16*
U.S. Cl. 556—476 8 Claims

1. A method of preparing 2-chloroethyldichlorosilane comprising reacting vinyldichlorosilane with hydrogen chloride in the presence of $FeCl_3$ at a temperature between 30° and 60° C.

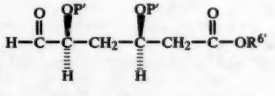
4,571,428

6-SUBSTITUTED-4-HYDROXY-TETRAHYDROPYRAN-2-ONES

Prasad K. Kapa, Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jul. 8, 1983, Ser. No. 512,163
Int. Cl.[4] C07F *7/08, 7/18, 7/10;* C07C *69/76*
U.S. Cl. 556—437 7 Claims

1. A compound of the formula:



wherein P′ is a protective group for a hydroxy function; and $R^{6'}$ is alkyl having from 1 to 3 carbon atoms, n-butyl, t-butyl or benzyl.

4,571,429
PROCESS FOR THE PREPARATION OF O-CARBOETHOXYBENZENESULFONAMIDE

George C. Chiang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 3, 1985, Ser. No. 730,155
Int. Cl.[4] C07C *143/67*
U.S. Cl. 560—12 4 Claims

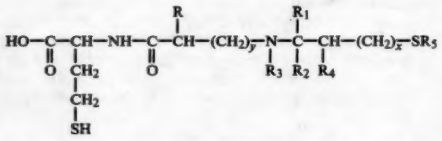
1. A process for producing o-carboethoxybenzene sulfonamide in high yield and purity comprising reacting saccharin with ethanol and concentrated sulfuric acid to produce a crude crystallized material containing residual saccharin, isolating the crude crystallized material by filtration and retaining the organic filtrate, and thereafter slurrying the crude material in aqueous sodium acetate to remove the saccharin residue therefrom and removing the pure o-carboethoxybenzene sulfonamide by filtration.

4,571,430
HOMOCYSTEINE AND HOMOCYSTEINAMIDE DERIVATIVES

Edmund F. Byrne, Alameda, Calif., and Glen L. Tolman, Chelmsford, Mass., assignors to Medi-Physics, Inc., Emeryville, Calif.

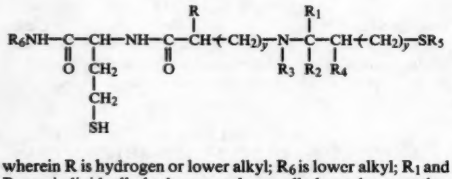
Division of Ser. No. 439,960, Nov. 8, 1982, Pat. No. 4,434,151. This application Nov. 28, 1983, Ser. No. 555,782
Int. Cl.[4] C07C *103/49, 103/76, 125/06*
U.S. Cl. 560—148 10 Claims

1. A compound of the formula:



wherein R is hydrogen or lower alkyl; R_1 and R_2 are individually hydrogen or lower alkyl or taken together form oxo; R_3 is an amino protecting group where R_1 and R_2 are individually hydrogen or lower alkyl; R_3 is hydrogen when R_1 and R_2 taken together form oxo; R_4 is hydrogen or lower alkyl; R_5 is hydrogen or a thiol protecting group; x and y are integers of from 0 to 2.

4. A compound of the formula:



wherein R is hydrogen or lower alkyl; R_6 is lower alkyl; R_1 and R_2 are individually hydrogen or lower alkyl or taken together form oxo; R_3 is hydrogen or an amino protecting group; R_4 is hydrogen or lower alkyl; R_5 is hydrogen or a thiol protecting group; and x and y are integers of from 0 to 2.

4,571,431
PROCESS FOR THE PRODUCTION OF ALLYL ACETATE

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 642,464, Aug. 20, 1984. This application May 24, 1985, Ser. No. 737,618
Int. Cl.[4] C07C *67/05*
U.S. Cl. 560—243 20 Claims

1. A process for preparing allyl acetate comprising reacting propylene, acetic acid, and oxygen under suitable reaction conditions in the presence of a catalyst consisting essentially of metals on a support, said metals consisting essentially of palladium, potassium, bismuth, and a promoting amount of magnesium or a combination of magnesium and barium.

4,571,432
PREPARATION OF CINNAMIC ACID

Jeffrey E. Telschow, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 24, 1984, Ser. No. 685,353
Int. Cl.[4] C07C *63/64*
U.S. Cl. 562—495 15 Claims

1. A process for the production of cinnamic acid, a ring-substituted cinnamic acid, and salts thereof from a halogenated benzal derivative and acetic acid derivative which comprises carrying out the reaction in the presence of an amine catalyst and adding an inert diluent, said inert diluent increasing the stirrability of the reaction mixture.

4,571,433
PROCESS FOR STABILIZING AQUEOUS SOLUTIONS OF ACETOACETAMIDES WITH SIMULTANEOUS REDUCTION IN THE CONTENT OF β-AMINOCROTONIC ACID AMIDES

Gerhard Künstle, and Herbert Jung, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,969
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335425
Int. Cl.[4] C07C *102/00, 103/147*
U.S. Cl. 564—4 2 Claims

1. In an improved process for stabilizing aqueous solutions of acetoacetamides and simultaneously reducing the content of β-aminocrotonic acid amides of the type including the step of reacting diketene with excess ammonia or primary or secondary amines in aqueous solutions while maintaining a pH value of 8–10, the improvement comprising the step of:

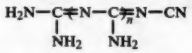
adding to the aqueous solutions of the acetoacetamides immediately after their preparation a sufficient amount of diketene at room temperature with vigorous agitation to obtain a pH value of 6–7.

4,571,434
OLIGO-IMINO-AMINES POSSESSING PLANT-PHYSIOLOGICAL ACTIVITIES AND PROCESS FOR PREPARING THE SAME

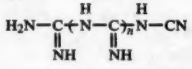
Takeshi Hashizume, and Hiroshi Onoda, both of Tokyo, Japan, assignors to Nihon Tokusan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,504
Claims priority, application Japan, Jun. 24, 1982, 57-107620
Int. Cl.[4] C07C *119/00, 125/08, 125/00*
U.S. Cl. 564—103 2 Claims

1. Oligo-imino-amines possessing plant-physiological activities represented by the general formula



or



Wherein n=4–6.

4,571,435

PREPARATION OF NITROGEN FERTILIZERS FROM OXALATE ESTERS PREPARED BY THE OXIDATIVE CARBONYLATION OF ALCOHOLS OVER NOBLE METAL CATALYSTS UTILIZING REGENERABLE 2,5-CYCLOHEXADIENE-1,4-DIONE OXIDANTS

Robert J. Radel, and Jack M. Sullivan, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 164,418, Jun. 30, 1980, Pat. No. 4,379,939, which is a continuation of Ser. No. 137,204, Apr. 4, 1980, now Defensive Publication No. T100,903. This application Dec. 3, 1981, Ser. No. 326,981

Int. Cl.[4] C07C *102/06, 67/36*

U.S. Cl. 564—135 17 Claims

1. A process for the preparation of product oxamide eminently suitable for use as slow release fertilizer and byproduct hydroquinone, which process comprises reacting in a reaction vessel under essentially anhydrous conditions, a mixture of saturated monohydridic aliphatic alcohol or alicyclic alcohol or aromatic alcohol of from 1 to 10 carbon atoms with carbon monoxide at pressures in the range between about 1000 psi and about 5000 psi (6.9×10^6 and 3.45×10^7 pascals), at temperatures in the range between about 80° C. and about 200° C., said reacting mixture in contact with a platinum group metal salt catalyst and a substituted or unsubstituted quinone, wherein the molar ratio of said quinone: platinum group metal salt ranges between about 3160:1 and about 100:1; venting the residual gases; purging the system with an inert gas; filtering and recycling said catalyst; ammoniating the resulting oxalate ester under an inert atmosphere at temperatures in the range between about −10° C. and about 40° C. at about atmospheric pressure for a predetermined time interval sufficient for said oxamide to be quantitatively precipitated; filtering and recovering said oxamide; stripping and recycling the excess ammonia; distilling the residual alcohol and solvent from the hydroquinone byproduct; recycling said excess ammonia, carbon monoxide, alcohol and solvent in said reaction vessel; and recovering said hydroquinone as byproduct.

4,571,436

PROCESS FOR PRODUCING OPTICALLY ACTIVE CYCLOPENTENOLONES

Takeaki Umemura; Ayumu Inoue, and Satoshi Mitsuda, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

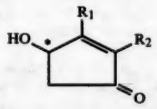
Filed May 21, 1984, Ser. No. 612,122

Claims priority, application Japan, May 25, 1983, 58-92943; Jun. 17, 1983, 58-109979

Int. Cl.[4] C07C *45/65*

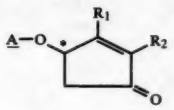
U.S. Cl. 568—354 23 Claims

1. A process for producing optically active cyclopentenolones represented by the formula (I),



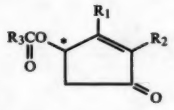
(I)

in which the mark * shows an asymmetric carbon; R_1 means a hydrogen atom or a C_1–C_3 alkyl group; and R_2 means a C_1–C_6 alkyl, C_2–C_6 alkenyl, or C_2–C_6 alkynyl group, which comprises hydrolyzing under acid conditions a mixture of an optically active ester having the absolute configuration opposite to that of the compound of the formula (I) and being represented by the formula (III),



(III)

in which the mark *, R_1 and R_2 have the same meaning as above, and A means a nitro or $-SO_2X$ group, X means a phenyl group which may have a methyl group, or a fluorine, chlorine, or bromine atom, at the para-position, or a C_1–C_3 alkyl group which may be substituted with one or more halogen atoms, and an optically active ester having the absolute configuration opposite to that of the ester of the formula (III), and being represented by the formula (II),



(III)

in which the mark *, R_1 and R_2 have the same meaning as above, and R_3 means a C_1–C_3 alkyl group.

4,571,437

PROCESS FOR PREPARING P-AMINOPHENOL AND ALKYL SUBSTITUTED P-AMINOPHENOL

Douglas C. Caskey, O'Fallon, and Douglas W. Chapman, St. Louis, both of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

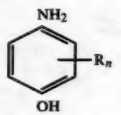
Continuation-in-part of Ser. No. 343,996, Jan. 29, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,857

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.[4] C07C *89/00*

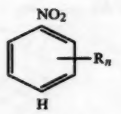
U.S. Cl. 564—418 18 Claims

1. A process for the preparation of substituted or unsubstituted p-aminophenol having the formula



where R is lower alkyl and n is 0, 1 or 2, the process comprising the steps of:

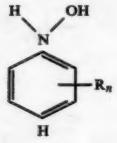
preparing a charge mixture comprising a substrate comprising a substituted or unsubstituted nitrobenzene having the formula



where R and n are as defined above, a highly dissociated acid, a catalyst containing platinum, and a divalent sulfur compound in which sulfur is bonded to two other moieties, said sulfur compound being present in a proportion of between about 0.1 and about 100 moles per gram atom of platinum, said mixture comprising an organic phase containing said substrate and an aqueous phase containing said acid;

introducing hydrogen into the mixture at a pressure of between about 0 and about 50 psig while agitating said

mixture at a temperature between about 70° C. and about 100° C., thereby causing said substrate to be reduced to a hydroxylamine having the formula



where R and n are as defined above, said hydroxylamine being rearranged in the presence of said acid to produce said substituted or unsubstituted p-aminophenol; and

recovering the p-aminophenol product from the aqueous phase.

4,571,438

PROCESS FOR PREPARING OLEFINIC ALDEHYDES AND CHEMICAL INTERMEDIATES

Jim D. Byers, and Dennis S. Banasiak, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 522,774, Aug. 12, 1983. This application Mar. 21, 1985, Ser. No. 714,410
Int. Cl.⁴ C07C *45/58*
U.S. Cl. 568—420 **12 Claims**

1. A process for the preparation of an olefinic aldehyde having the formula:

$$H-(CR_2)_x-CH_2-CH=CH-CH_2-(CR_2)_y-CHO$$

wherein x=0–20, inclusive, y=1–20, inclusive, and each R is independently h, C_1–C_{20} alkyl, cycloalkyl, aryl, aralkyl, and alkaryl which comprises the steps of:

(a) reacting an α,ω-dihalide having the formula:

$$X-CH_2-(CR_2)_y-CH_2-X$$

wherein X is Cl, Br or I, and Y and R are as defined above, with a metal acetylide having the formula:

$$M-C\equiv C-CH_2-(CR_2)_x-H$$

wherein M is Li or Na and x and R are as defined above to give a reaction product containing an acetylenic halide having the formula:

$$H-(CR_2)_x-CH_2-C\equiv C-CH_2-(CR_2)_y-CH_2-X$$

wherein x, y, R and X are defined above;

(b) oxidizing the acetylenic halide obtained in (a) to give an acetylenic aldehyde having the formula:

$$H-(CR_2)_x-CH_2-C\equiv C-CH_2-(CR_2)_y-CHO$$

wherein x, y, R and X are as defined above; and

(c) hydrogenating the acetylenic aldehyde obtained in (b) with hydrogen and a selective hydrogenation catalyst to give said olefinic aldehyde.

4,571,439

METHOD FOR CONTROLLED OLIGOMERIZATION/ETHERIFICATION OF PROPYLENE

Donald A. Keyworth, Houston, Tex., assignor to Tenneco Oil Company, Houston, Tex.

Filed Jul. 22, 1985, Ser. No. 757,483
Int. Cl.⁴ C07C *43/04, 2/28*
U.S. Cl. 568—697 **15 Claims**

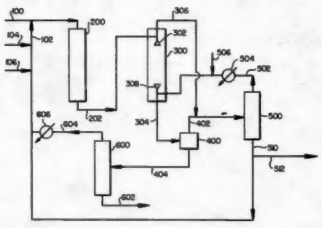
1. A process for the reaction of propylene in a hydrocarbon feed stream comprising contacting said feed stream containing propylene and at least 5 weight % isobutene based on said feed stream in liquid phase with an acidic cation exchange resin at temperatures in the range of 80°–130° C. at LHSV in the range of 2 to 5 in the presence of methanol to produce a product stream essentially comprising C_6 to C_8 mono olefins, methyl isopropyl ether, methyl tertiary butyl ether and unreacted material, the amount of methanol present being determined by a residual of said methanol in said product stream in the range of 0.03 to 0.9 wt. % based on said product stream.

4,571,440

CONTINUOUS PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOL IN THE PRESENCE OF ORGANOMETALATE

Brian T. Keen, and John H. Robson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 594,266, Mar. 28, 1984, abandoned. This application Oct. 23, 1984, Ser. No. 663,827
Int. Cl.⁴ C07C *29/86, 31/20, 33/26, 35/14*
U.S. Cl. 568—872 **24 Claims**



1. A continuous process for making alkylene glycols by the hydrolysis of alkylene oxide with water in the presence of selectivity-enhancing metalate anion-containing material comprising:

(a) providing alkylene oxide and water to a reaction zone containing selectivity-enhancing amounts of the metalate anion-containing material provided as an organometalate having an organic-containing cation and a metalate anion, said zone being maintained under conditions sufficient to form an aqueous solution of alkylene glycol, said aqueous solution also containing organometalate;

(b) withdrawing aqueous solution from the reaction zone and contacting at least a portion of the aqueous solution with a water-immiscible solvent in an extraction zone, in which solvent the organometalate is preferentially soluble as compared to water, to form an organometalate-rich solvent;

(c) separating the aqueous solution and the organometalate-rich solvent by phase separation to form an aqueous glycol-containing stream and a solvent-containing stream;

(d) separating at least a portion of the solvent-containing stream into an organometalate-lean stream containing water-immiscible solvent and into an organometalate-rich stream; and

(e) introducing at least a portion of the organometalate-lean stream into the extraction zone to form at least a portion of the water-immiscible solvent and introducing at least a portion of the organometalate-rich stream into the reac-

tion zone to form at least a portion of the organometalate therein.

4,571,441
PROCESS FOR SEPARATION OF SUBSTITUTED BENZENE ISOMERS

Kishio Miwa; Yukiko Nagaoka, both of Kamakura, and Takehisa Inoue, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,927
Claims priority, application Japan, Dec. 28, 1982, 57-231207
Int. Cl.[4] C07C *17/38, 25/00*
U.S. Cl. 570—211 **10 Claims**

1. A process for separating a meta- substituted benzene from a mixture containing ortho-, meta- and para-substituted benzene isomers, said benzene isomers being selected from the group consisting of mono-halogenated-toluene, di-halogenated-benzene and di-ethylbenzene, comprising:

contacting the isomer mixture with a faujasite type zeolite adsorbent containing at least one cation selected from the group consisting of Ag and Cu and containing at least one cation selected from the group consisting of Na and K, whereby the ortho- and para- substituted benzene isomers are adsorbed by the adsorbent, and

recovering the meta-substituted benzene as a raffinate component.

4,571,442
PROCESS FOR SELECTIVELY HYDROGENATING ACETYLENE IN A MIXTURE OF ACETYLENE AND ETHYLENE

Jean Cosyns, Maule, and Jean-Paul Boitiaux, Paris, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 19, 1984, Ser. No. 652,035
Claims priority, application France, Sep. 19, 1983, 83 14969
Int. Cl.[4] C07C *5/08*
U.S. Cl. 585—261 **18 Claims**

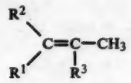
1. A process for the selective hydrogenation of acetylene in a mixture of acetylene and ethylene, wherein said mixture is passed through a palladium-on-alumina catalyst, in the presence of a liquid phase comprising at least one hydrocarbon, said liquid phase containing 15 to 100% by weight of at least one aromatic hydrocarbon and further containing at least one amine compound dissolved in the liquid phase and selected from the group consisting of primary amines, secondary amines and polyamines, so as to increase the overall content of ethylene in the resultant mixture.

4,571,443
PROCESS FOR EFFECTING OXIDATIVE DEHYDRODIMERIZATION

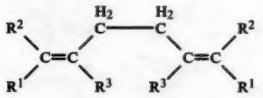
Robert DiCosimo, Shaker Heights; James D. Burrington, Richmond Heights, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 23, 1985, Ser. No. 757,984
Int. Cl.[4] C07C *2/72*
U.S. Cl. 585—428 **3 Claims**

1. A process for the catalytic oxidative dehydrodimerization of a substrate compound,



to yield a product,



wherein R^2 is H, alkyl, phenyl, heteroaromatic containing a single N atom as the sole heteroatom, or cyano, and wherein R^1 and R^3 either (1) together complete a single ring aromatic group, (2) together with a single N atom complete a single ring heteroaromatic group containing only one heteroatom, or (3) are each independently selected from H, alkyl, phenyl, cyano or a single ring heteroaromatic group having one N atom as the sole heteroatom, with the proviso that when (3) is selected neither R^1 nor R^2 is bonded to the carbon containing the double bond by a carbon that is bonded to H, and

wherein said substrate has 3–12 C atoms, said process comprising:

(A) providing a crystalline, oxide ion conductive, catalyst in the form of a fluid-impervious membrane forming a wall separating a reaction zone and an oxidant supply zone so that fluid cannot flow from either zone to the other,

(B) introducing said substrate into said reaction zone in the vapor or gaseous phase in contact with said catalyst, and

(C) introducing a gas containing molecular oxygen into said supply zone in contact with said catalyst,

the reaction zone and said catalyst being maintained at a temperature above 500° C. at which the catalyst membrane conducts oxide ions across said membrane from the supply zone to the surface of the catalyst membrane forming a wall of the reaction zone, said crystalline, oxide ion conductive, catalyst having the atoms and atomic proportions indicated by the following empirical formula:

$$BiL_aM_bO_x$$

wherein

L is at least one of Y, V, Nb, Ta, W, Mo, Pb, La, Nd, Sm, Er, Yb, Dy and Gd;

M is at least one of Ca, Ba, and Sr;

a=0–1, and

b=0–0.1.

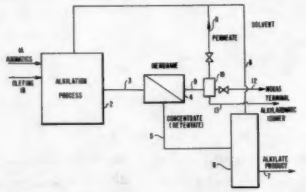
4,571,444
PROCESS FOR SEPARATING ALKYLAROMATICS FROM AROMATIC SOLVENTS AND THE SEPARATION OF THE ALKYLAROMATIC ISOMERS USING MEMBRANES

Laura E. Black, and Heather A. Boucher, both of Sarnia, Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 27, 1984, Ser. No. 603,028
Int. Cl.[4] C07G *7/144*
U.S. Cl. 585—819 **14 Claims**

1. A method for separating alkylaromatic from a stream comprising a mixture of said alkylaromatics, unconverted

aromatic and alkylating agent starting material and coproduced by-product by contacting said mixed stream with a perm-selective asymmetric membrane under reverse osmosis conditions, whereby the unconverted aromatic and alkylating agent starting materials permeate through the asymmetric



membrane yielding a permeate stream rich in such unconverted starting material and containing a quantity of co-permeated alkylaromatic material and a retentate steam rich in alkylaromatic product and by-product and lean in the aromatic and alkylating agent starting material.

4,571,445

PROCESS FOR REMOVAL OF SULFUR COMPOUNDS FROM CONJUGATED DIOLEFINS

Lynn H. Slaugh, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

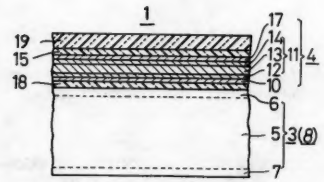
Filed Dec. 24, 1984, Ser. No. 685,653
Int. Cl.[4] C07C 7/00
U.S. Cl. 585—852 10 Claims

1. A process for reducing the level of sulfur compounds selected from hydrogen sulfide and carbon disulfide in a sulfur compound-containing liquid conjugated diolefin hydrocarbon having an atmospheric boiling point in the range from about −5° to about 45° C. which comprises contacting said liquid diolefin at a temperature up to about the boiling point of said liquid diolefin with a sorbent prepared by combining a porous particulate alumina having a surface area of about 100 to 365, M^2 per gram with a compound decomposable to sodium oxide, barium oxide, calcium oxide or a compound decomposable to potassium oxide, but excluding the carbonate or bicarbonate of potassium; and calcining the resultant alumina product at a temperature from about 350° to about 600° C.

4,571,446
PHOTOELECTRIC CONVERSION PANEL AND ASSEMBLY THEREOF

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Co., Ltd., Japan

Filed May 25, 1984, Ser. No. 614,211
Claims priority, application Japan, May 25, 1983, 58-92177
Int. Cl.[4] H02L *25/00, 31/06;* H01N *6/00*
U.S. Cl. 136—244 6 Claims



5. A photoelectric conversion panel assembly comprising:

a plurality of photoelectric conversion panels disposed side by side in a frame;

wherein each photoelectric conversion panel comprises a light-transparent substrate and a laminated member formed on the substrate and comprising, in sequence, a light-transparent first conductive layer, at least one PIN type non-single-crystal semiconductor laminate member, and a second conductive layer;

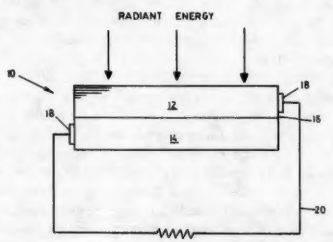
wherein the light-transparent substrate of each photoelectric conversion panel comprises a flexible, chemically reinforced glass sheet having potassium containing glass layers formed in the opposite main surfaces of an alkali free or alkali containing glass sheet having a thickness of 0.2 to 1.2 mm; and

wherein the frame is a flexible plastic frame reinforced with carbon fibers.

4,571,447
PHOTOVOLTAIC CELL OF SEMI-CONDUCTING DIAMOND

Johan F. Prins, 8 Portland Pl., Northcliff Ext. 15, Johannesburg, Transvaal, South Africa

Filed Jun. 22, 1984, Ser. No. 623,773
Claims priority, application South Africa, Jun. 24, 1983, 83/4629
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—252 11 Claims

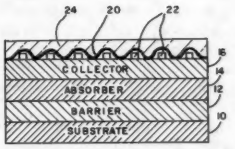


1. A photovoltaic cell, comprising a thin film formation of diamond or diamond-like material containing a p-n junction between a p-type semiconducting layer and an n-type semiconducting layer.

4,571,448
THIN FILM PHOTOVOLTAIC SOLAR CELL AND METHOD OF MAKING THE SAME

Allen M. Barnett, Newark, Del., assignor to University of Delaware, Newark, Del.

Filed Nov. 16, 1981, Ser. No. 321,381
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—259 48 Claims



48. A photovoltaic solar cell device including a back surface reflector comprising:

a substrate including a reflective upper surface;

at least one layer of photoactive semiconductor material over said reflective surface;

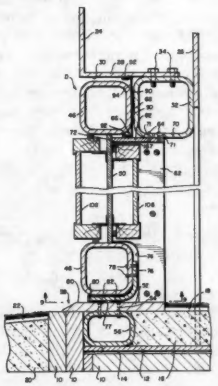
a layer of transparent conductive material between said reflective surface and said at least one layer of semiconductor material, said layer of transparent conductive material acting as a barrier to diffusion of material from said reflective surface into said at least one semiconductor layer;

the improvement wherein said layer of transparent conductive material has a predetermined thickness selected to provide enhanced reflection of light which has passed through said at least one layer of semiconductor material.

4,571,449
SHIELDED DOOR ASSEMBLY

James N. Lindenberger; Bert M. Christie, both of Culver City, and Roy V. Johnson, San Fernando, all of Calif., assignors to Dow Industries, Culver City, Calif.

Filed Aug. 16, 1984, Ser. No. 641,482
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 MS 23 Claims



1. A shielded door assembly for a generally rectangular opening in the electrically conductive wall of a grounded building, comprising:

(a) an electrically conductive first frame secured to said wall along three sides of said opening, said first frame in electrical connection with said wall;

(b) an electrically conductive tubular frame secured to said first frame along the three sides thereof, said tubular frame in electrical connection with said first frame;

(c) an electrically conductive threshold having a non-interrupted contact surface secured to said tubular frame at the remaining side of said opening, said threshold in electrical connection with said tubular frame;

(d) an electrically conductive door stop secured to a first edge of said tubular frame and extending outwardly therefrom along the perimeter thereof generally parallel to said first frame and cooperating with said tubular frame and said first frame for defining a pocket;

(e) said pocket includes a second edge of said tubular frame extending transverse of said first edge and providing a contact surface;

(f) an electrically conductive tubular door rim pivotally secured to said first frame and adapted for pivoting between an open and a closed position, said door rim contiguous with at least said tubular frame when in said closed position;

(g) an electrically conductive panel member secured to said door rim and in electrical connection therewith and therewith providing said door;

(h) said door including a first surface thereof adjacent said threshold contact surface when in said closed position;

(i) a plurality of electrically conductive resilient spring means secured to said first surface and in electrical connection therewith and adapted for sliding wiping engagement with said contact surface as said door pivots from said open to said closed position for thereby establishing electrical contact between said door and said contact surface;

(j) said door frame including a second surface adjacent said second edge when said door is in said closed position;

(k) a plurality of electrically conductive resilient spring means secured to one of said second surface and said second edge and in electrical connection therewith and adapted for non-sliding pressure contact with the other one of said second surface and said second edge for thereby establishing electrical connection therebetween;

(l) electrically conductive means associated with one of said door stop and said door panel member engageable with the other one of said door stop and said door panel member for establishing electrical connection therebetween when said door is in said closed position; and

(m) means associated with said door for maintaining said door in said closed position whereby said spring means of said first surface contacts said threshold and said spring means of said second surface and said second edge establishes electrical connection therebetween such that signals impinging on said door, said first frame and said tubular frame are conducted to said wall for thereby being grounded and substantially preventing passage thereof through said opening.

4,571,450

MOISTURE IMPERVIOUS POWER CABLE AND CONDUIT SYSTEM

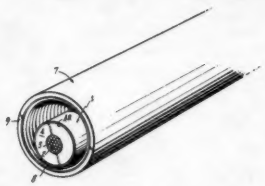
Edward K. Duffy, West Lafayette, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Dec. 27, 1983, Ser. No. 565,941
Int. Cl.[4] H02G *9/06, 3/04;* H01B *9/02*
U.S. Cl. 174—68 C **5 Claims**

1. An underground moisture impervious, electrical power cable and conduit system comprising:

a moisture impervious, flexible conduit having an inner layer of a flexible, moisture impervious, electrically conductive material, and an outer layer of a polymeric, electrically insulating material,

said conduit having a high voltage electrical cable loosely disposed inside, said cable comprising a core of electrically conductive material coated with an electrically insulating polymeric material about which is a layer of semiconductive polymeric material, wherein said cable is



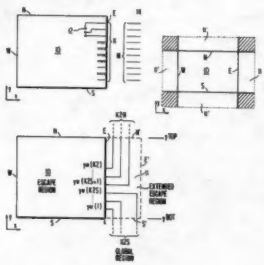
in sufficient electrical contact with the inner layer of the conduit which acts as a concentric neutral.

4,571,451

METHOD FOR ROUTING ELECTRICAL CONNECTIONS AND RESULTING PRODUCT

Ralph Linsker, Scarsdale, and Roger S. Rutter, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1984, Ser. No. 616,869
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—68.5 **14 Claims**



1. In a wiring interconnection structure having at least one plane-pair for routing connections between pins; each said plane-pair including a signal plane having connections disposed in a preferred direction parallel to a first axis and an adjacent signal plane having connections disposed in a preferred direction predominantly parallel to a second axis, said second axis being perpendicular to said first axis; a wiring pattern on said plane-pair comprising:

at least one escape region of the plane-pair, defined by a rectangular boundary, containing a cluster of pins and escape segments of the connections in both signal planes, each escape segment extending from one of said pins in said cluster to said escape region boundary;

at least one extended escape region of the plane-pair, defined by a rectangular boundary, wherein one side of the extended escape region is co-located with at least a portion of a side of the escape region boundary; each extended escape region containing extended escape segments of said connections, each extended escape segment being connected to and extending from an end of an escape segment of said connection at said escape region boundary, co-located with said extended escape region boundary, to another side of said extended escape region adjacent to a global region of the plane-pairs, without changing signal planes, said extended escape segments proximate to said global region being disposed in the preferred direction of its respective signal plane; and

said global region of the signal-plane having global segments of the connections wherein each of said global segments comprises portions of the connections that do

not lie within any escape region or extended escape region.

8. A method for routing connections in a multiple-plane wiring interconnection structure, said planes arranged in plane-pairs wherein a first signal plane in each of said plane-pairs has connections predominantly disposed in a direction parallel to a first axis associated with that signal plane and an adjacent signal plane of said plane-pair has connections disposed in a direction parallel to a second axis associated with said adjacent signal plane, said second axis being perpendicular to said first axis, comprising:

routing an escape segment of each of said connections from a pin in a congested pin area to a boundary of an escape region surrounding said congested pin area;

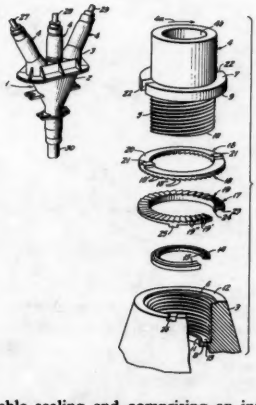
routing an extended escape segment of each of said connections between an end of said escape segment at said escape region boundary to a boundary defining an extended escape region, so that each said extended escape segment terminates at the extended escape region boundary in a direction parallel with the axis associated with the signal plane in which the connection is disposed; and

routing a global segment of each of the connections from an end of the extended escape segment at said extended escape region boundary through a global region.

4,571,452
ELECTRIC CABLE SEALING END

Giancarlo Giubileo, Nerviano, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jul. 13, 1984, Ser. No. 630,652
Claims priority, application Italy, Jul. 22, 1983, 22189 A/83
Int. Cl.[4] H02G *15/04*
U.S. Cl. 174—77 R **8 Claims**

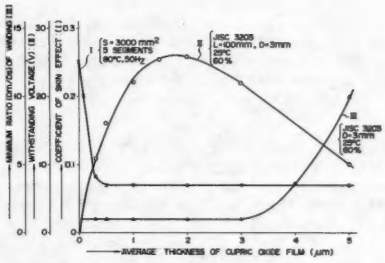


1. In a cable sealing end comprising an insulator with a central bore for the passage of a cable therethrough, a threaded portion around said bore and a first flange extending outwardly of said threaded portion, a box part with a through opening having internal threads which mate with the threaded portion of said insulator and having a second, internal flange around said opening with a resilient sealing member thereon engageable with an end surface of said insulator spaced from said first flange in the direction of said second flange and having an end surface adjacent said first flange when said insulator threaded portion is screwed into said box part through opening, said sealing member being compressed between said end surface of said insulator and said second flange when said insulator threaded portion is screwed into said box part through opening, the improvement comprising said resilient sealing member having an inner dimension at least as large as the dimension of said central bore when such sealing member is compressed between said end surface of said insulator and said second flange, whereby said sealing member does not compress a cable within said central bore when said sealing member is compressed, and mechanical locking means intermediate said first flange and said end surface of said box part for permitting rotation of said insulator in the direction in which it is screwed into said through opening and preventing rotation of said insulator in the opposite direction after said end surface of said insulator engages and compresses said resilient sealing member.

4,571,453
CONDUCTOR FOR AN ELECTRICAL POWER CABLE

Michio Takaoka, Chiba; Tsuneaki Mohtai, Yachiyo; Syotaroh Yoshida, and Kazuo Watanabe, both of Tokyo, all of Japan, assignors to The Fujikura Cable Works, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 490,986, May 9, 1983, abandoned. This application May 15, 1984, Ser. No. 610,566
Claims priority, application Japan, Nov. 9, 1978, 53-138066
Int. Cl.[3] H01B *3/10*
U.S. Cl. 174—110 A **1 Claim**



1. A stranded conductor for an electrical power cable constituted by a plurality of stranded cooper strands, at least one of said strands being covered with a cupric oxide film having a thickness of from about 0.3 to about 3 μm, free from exfoliation, and formed by oxidizing said one strand and forming an insulating film for electrically insulating said one strand from the other strands.

4,571,454
COORDINATE POSITION DIGITIZING SYSTEM

Hideshi Tamaru, Sagamihara; Kunio Shikakura, Tokyo; Nobuo Kitamura, Sagamihara; Kimiyoshi Yoshida, Zushi, and Akio Sakano, Ibaragi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 4, 1983, Ser. No. 548,766
Claims priority, application Japan, Nov. 11, 1982, 57-198090
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **3 Claims**

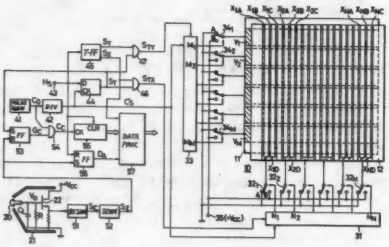
1. A coordinate position digitizing system comprising:

a position determining plate having a plurality of first strip electrodes provided on one surface of an insulating layer to extend parallel to one another in one direction at regularly spaced intervals and form plural groups thereof disposed successively, each of said groups having a successive fraction of the plurality of first electrodes connected in common, and a plurality of second strip electrodes provided on another surface of the insulating layer to extend parallel to one another at regularly spaced intervals in a second direction perpendicular to said first electrodes;

detecting electrode means provided to face to said one surface of the insulating layer and connected through a predetermined capacitance to a reference potential point for

producing a signal in response to a voltage obtained thereat,

driving and controlling means for supplying a constant voltage selectively to said groups of the first electrodes one after another during a first period and also supplying the constant voltage selectively to said second electrodes one after another during a second period, and



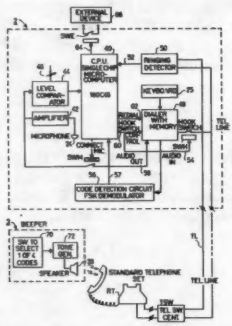
means for producing positional data defining positions of said detecting electrode means on said position determining plate in both the one direction of said first electrodes and the second of said second electrodes in response to the signal derived from said detecting electrode means.

4,571,455

ELECTRONIC MONITORING SYSTEM PARTICULARLY USEFUL AS AN ELECTRONIC BABYSITTER

Yoram Labock, 9 Bavly St., Tel-Aviv; Israel Feuerstein, 59 Aharonson St., Ramat-Gan, and Avi Geiger, 6 Biniamini St., Tel-Aviv, all of Israel

Filed Dec. 6, 1983, Ser. No. 558,434
Int. Cl.[4] H04M *11/04*
U.S. Cl. 179—2 A **3 Claims**



1. An electronic monitoring system comprising monitoring means connectable to the telephone line at the location to be monitored; and a portable sound-producing unit for transmitting first and second codes to said monitoring means via a remote telephone and the telephone line; said monitoring means including:

a microphone for picking up local sounds at said location to be monitored;

a sound level comparator comparing the sounds picked up by said microphone with a predetermined threshold value;

means for manually presetting and storing the number of a selected remote telephone;

a code detecting for detecting the code transmitted by said portable sound-producing unit to said monitoring means via said remote telephone and the telephone line;

automatic dialing means for automatically dialing said selected remote telephone number; and

control means including

alarm indicating means indicating an alarm condition when the sound picked up by said microphone exceeds said predetermined threshold value for a predetermined time; and means effective:

(a) upon detecting said first code from said portable sound-producing unit to enable the listener at the remote telephone to hear via the telephone line the sounds picked up by said microphone; and

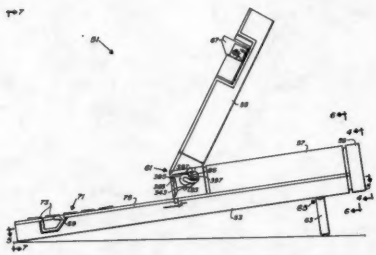
(b) upon detecting said second code from said portable sound-producing unit, to automatically dial said selected remote telephone number whenever said alarm condition is indicated by said alarm indicating means.

4,571,456

PORTABLE COMPUTER

David C. Paulsen, Santa Clara; Glenn T. Edens, Menlo Park; Karl S. Nakamura, Santa Clara; David M. Gallatin, San Jose; Stephen R. Hobson, and William G. Moggridge, both of Palo Alto, all of Calif., assignors to Grid Systems Corporation, Mountain View, Calif.

Filed Oct. 18, 1982, Ser. No. 435,126
Int. Cl.[4] H04M *11/00*; A47B *88/00*; G09G *1/00*
U.S. Cl. 179—2 C **19 Claims**



1. A portable computer constructed to be contained within an outer case for transport and to be erectable to a viewing and operating configuration for use, said computer comprising

a base,

a display housing,

a top cover,

a rear cover,

hinge means for permitting swinging movement display housing about an axis of rotation adjacent the rear end of the dispaly housing and from a closed and latched position of the display housing on the base to an erected position for viewing by an operator, and including stop means for holding the display housing at the desired angle for viewing,

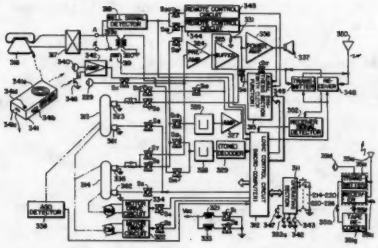
the hinge means being located in a mid portion of the base and wherein the hinge means permit swinging movement of the display housing to an erected position in which the inner surface of the display housing is held in an upward and rearwardly inclined angle for viewing by an operator in front of the computer, and

including a keyboard in the portion of the base which is exposed by the movement of the display housing to the erected position.

4,571,457
AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS

Motoichi Hattori, Fujisawa, and Hideyasu Ishigo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 518,411, Jul. 29, 1983. This application Jul. 22, 1985, Ser. No. 757,198
Claims priority, application Japan, Jul. 30, 1982, 57-133521
Int. Cl.[4] H04Q 7/04; H04M 1/65
U.S. Cl. 179—2 EA 3 Claims



1. An automatic telephone answering and recording apparatus for communicating between calling and called subscriber stations connected in a telephone system comprising:

a speaking circuit provided at a called subscriber station;

first means responsive to a call signal transmitted by a calling subscriber station over a telephone line to connect said speaking circuit to the calling subscriber station;

second means activated in response to activation of said first means for transmitting an answering message previously recorded on a first recording medium located at the called subscriber station to the calling subscriber station in response to the call signal;

a first radio transmitter and receiver set coupled to said speaking circuit;

a second radio transmitter and receiver set remotely located from said called subscriber station and wirelessly coupled to said first radio transmitter and receiver set for transmitting signals therebetween to enable the second radio transmitter and receiver set to be connected into the speaking circuit through the first radio transmitter and receiver set;

third means coupled between said first radio transmitter and receiver set and said first means for deactivating said second means upon receipt of signals wirelessly transmitted from said second radio transmitter and receiver set, the activation of the second means being maintained in the absence of the receipt of signals from said second radio transmitter and receiver set;

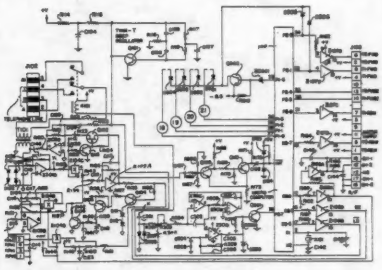
fourth means activated in response to activation of said first means for recording after completion of the answering message an incoming message from the calling subscriber station on a second recording medium located at the called subscriber station, said fourth means being deactivated upon receipt of signals wirelessly transmitted from said second radio transmitter and receiver set, the activation of the fourth means being maintained in the absence of the receipt of signals from said second radio transmitter and receiver set; and

recording/playback means located at the location of the second radio transmitter and receiver set and having associated means selectively operable to cause the recording/playback means to record communications from the calling subscriber which are transmitted from the first ratio transmitter and receiver set to the second radio transmitter and receiver set, and also being selectively operable to cause the recording/playback means to record communications from the called subscriber that are transmitted from the second radio transmitter and receiver set to the first radio transmitter and receiver set.

4,571,458
TELEPHONE ANSWERING SYSTEM WITH ADDITIONAL MESSAGE STORAGE CAPABILITIES

Raymond G. Bond, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Filed Oct. 31, 1983, Ser. No. 546,980
Int. Cl.[4] H04M 1/65
U.S. Cl. 179—6.11 9 Claims



1. In a telephone answering system which responds to telephone messages received over a telephone line and which includes a first mechanism including a first magnetic tape (T-1) having a recorded announcement thereon at a first predetermined position to be transmitted over the telephone line to a caller during an announcement mode (T_1) in response to a telephone call, and a second mechanism including a second magnetic tape (T-2) for recording messages received over the telephone line during a message recording mode (T_2) following the announcement mode (T_1), and which responds to a remote control tone signal received over the telephone line from a caller to effectuate predetermined control operations; the combination a microcomputer; circuit means adapted to be coupled to the telephone line for receiving the remote tone signal transmitted over the telephone line and for introducing the remote tone signal to the microcomputer; an input circuit adapted to be coupled to the telephone line for receiving audio signals therefrom representing a message from a caller and for recording the audio signals in a particular track on the first magnetic tape at the first predetermined position thereon; an output circuit adapted to be coupled to the telephone line for transmitting to a caller audio signals representing messages recorded on the particular track of the first magnetic tape; a first circuit connecting the microcomputer to the first magnetic tape mechanism (T-1) to cause the first magnetic tape to move in a forward direction; said microcomputer responding to the remote tone signal from a caller received over the telephone line to cause the first circuit to move the first magnetic tape to a second predetermined position displaced along said track from said first predetermined position, and said microcomputer causing said input circuit to be coupled to the telephone line to enable a message from the calling party to be recorded sequentially on the same track of said first magnetic tape at the second predetermined position.

4,571,459
TELEPHONE ANSWERING MACHINE

Kei Yata, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Sake, Japan

Filed Jul. 18, 1983, Ser. No. 514,589
Int. Cl.[4] G11B 5/00, 21/00
U.S. Cl. 179—6.13 18 Claims

1. A telephone answering machine for reproducing a prerecorded reply message of a called party in response to detection

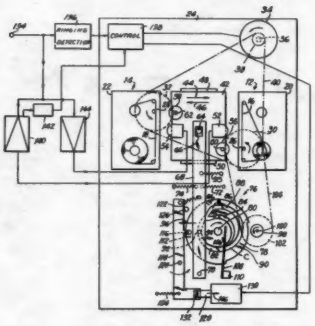
of a calling signal from a caller and for recording a message of a caller in response to the completion of reproduction of the reply message, comprising:

a first magnetic tape having said prerecorded reply message thereon;

a second magnetic tape for recording the caller's message thereon;

a first tape drive means for running said first magnetic tape to reproduce the reply message therefrom;

a second tape drive means for running said second magnetic tape to record the caller's message thereon;



a drive source for driving said first and second tape drive means; and

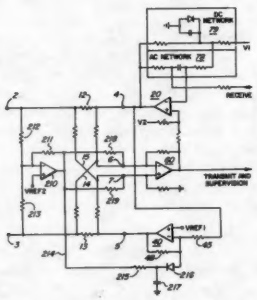
a single common operation control means for controlling the operations of said first and second tape drive means in such manner that the first tape drive means operates in a first cycle of operation of said single common operation control means and the second tape drive means operates in a second cycle of operation of said single common operation control means.

4,571,460

ACTIVE IMPEDANCE LINE FEED CIRCUIT WITH IMPROVED GROUND FAULT PROTECTION

Stanley D. Rosenbaum, and Calvin Plett, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 12, 1984, Ser. No. 588,156
Int. Cl.[4] H04M *1/74, 1/76, 19/00*
U.S. Cl. 179—16 AA **11 Claims**



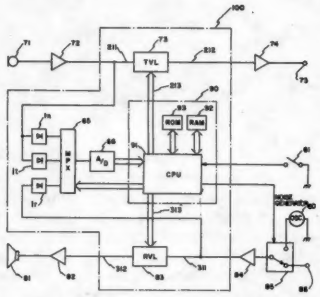
1. An active impedance line feed circuit comprising: tip and ring amplifiers being responsive to a control signal being proportional to currents in tip and ring feed resistors for supplying energizing current and a.c. information signals to a two wire communication line via tip and ring terminals connected to outputs of the tip and ring amplifiers by the tip and ring feed resistors respectively, tip and ring voltage dividers including tip and ring voltage taps respectively, a control circuit for generating the control signal and having a differential input connected across the tip and ring voltage taps, and a d.c. amplifier having an inverting input resistively connected to the tip and ring terminals and an output resistively connected to the tip and ring voltage taps.

4,571,461

CONFERENCE TELEPHONE APPARATUS

Kinichi Uno, and Tohru Nakahara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,463
Claims priority, application Japan, Apr. 18, 1983, 58-68003
Int. Cl.[4] H04M *1/60*
U.S. Cl. 179—81 B **15 Claims**



1. A conference telephone apparatus comprising:

a transmit communication path means including a microphone and a first variable loss circuit which applies a loss to a transmitted signal output from said microphone;

a receive communication path means including a second variable loss circuit for applying a loss to a received signal, and a loudspeaker for converting an electric signal into a voice signal, said electric signal being supplied via said second variable loss circuit;

transmitted signal level dectector means for detecting an envelope of the transmitted signal;

received signal level detector means for detecting an envelope of the received signal;

means for generating a noise signal which extends over a speech band;

means for connecting the noise signal generating means to the receive communication path means when it is being activated;

means for setting the second variable loss circuit to a first loss level so that a noise signal level picked up by the microphone becomes sufficiently higher than a background noise level;

means for measuring a signal caused by an acoustic coupling loss which is indicative of the application of an electric input signal to the speaker and an electric output signal from the microphone, said measuring means processing an output level of the transmitted signal level detector means which is indicative of a level of the noise signal which is emitted from the loudspeaker responsive to signals received via the receive communication path, the output level of the received signal level detector means being indicative of the noise signal, and the first loss;

means for measuring the reverberation time by monitoring an echo level picked-up by the microphone from an instant when the noise signal from the noise signal generator is interrupted by inserting a maximum insertion loss into the second variable loss circuit;

means for predetermining a sum of insertion losses of the first and second variable loss circuits which prevents howling from the acoustic coupling loss; and

means for controlling the first and second variable loss circuits such that, after the connecting means is deactivated, one of the transmit and receive communication paths has a first gain which is sufficiently high to enable a hands-free telephone conference and the other of the paths has a gain smaller than the first gain in response to a difference between a received signal level and a transmitted signal level.

4,571,462
MULTIPLE USE DIGITAL TONE GENERATOR IN TELEPHONE

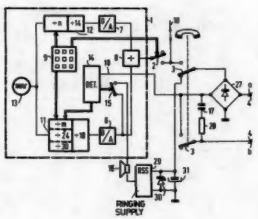
Daniël J. G. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,603

Claims priority, application Netherlands, Oct. 27, 1983, 8303701

Int. Cl.⁴ H04M *1/50*

U.S. Cl. 179—84 T **7 Claims**



1. In an electronic telephone set having line terminals, number selection push-buttons, digital tone generator means having an oscillator having a fixed oscillator frequency and logic circuit means connected to said oscillator and comprising first frequency divider means for dividing said oscillator frequency by one of the plurality of divisors selectable under control of said number selection push buttons, a plurality of further control elements, and means for externally generating a control signal, the improvement comprising:

detection means for detecting said externally generated control signal and generating a frequency control signal in response thereto;

additional frequency dividing means; and

means for interconnecting said additional frequency dividing means between said first frequency divider means and said selected one of said further control elements in response to said frequency control signal.

4,571,463
METHOD AND SYSTEM FOR AUTOMATICALLY INSERTING AT LEAST ONE PAUSE INTO MEANS FOR MEMORIZING A DIALING SEQUENCE

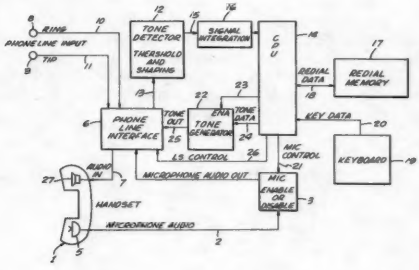
Gerald E. Shefler, Milwaukie, Oreg., assignor to Code-A-Phone Corporation, Clackamas, Oreg.

Filed Jun. 1, 1984, Ser. No. 616,317

Int. Cl.⁴ H04M *1/274, 3/44*

U.S. Cl. 179—90 B **13 Claims**

12. A system for automatically storing data representing at least one pause in a sequence of data representing a dialing sequence comprising means for memorizing a dialing sequence and said at least one pause, all in the correct order; means for detecting the appearance, persistence and interruption of dial tone on a telephone line within a time period substantially shorter than a human listener requires to perceive said dial tone and to engage means for generating a signal representing at least one member of said dialing sequence; means for detecting engagement of means for generating, on said line, a signal representing at least one member of said dialing sequence; means for delaying said generating immediately after said detecting for a time sufficient to detect persistence or interruption of said dial tone on said line, but within a time period substantially imperceptible to a human listener; and means for



automatically storing data representing a pause in said dialing sequence in said memorizing means before storing data representing a dialing sequence member if said dial tone is detected before, and persists on said line uninterrupted after said engagement.

4,571,464
ELECTRET MICROPHONE

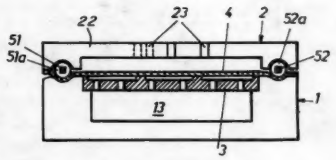
Tommy S. Segerö, Tyresö, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jun. 13, 1984, Ser. No. 620,112

Claims priority, application Sweden, Aug. 19, 1983, 8304504

Int. Cl.⁴ H04K *19/01*

U.S. Cl. 179—111 E **6 Claims**



1. An electret microphone comprising a casing including upper and lower casing halves, a rectangular metal electrode in said casing, said rectangular metal electrode having long and short sides, a metallized electret film which substantially covers the metal electrode, an amplifier element in the form of an integrated circuit capsule with a plurality of contact pins, a U-shaped contact element including a flat web portion and two prongs provided with elastic and electrically conductive material, wherein said prongs extend along the short sides of the rectangular metal electrode such that the electret film is retained by friction with said elastic material.

4,571,465
ECHO CANCELLER FOR A BASEBAND DATA SIGNAL

Richard Brie, Paris, and Loic B. Y. Guidoux, Garancieres, both of France, assignors to Radioelectriques et 501 Telecommunications, Paris, France

Filed Oct. 6, 1983, Ser. No. 539,584

Claims priority, application France, Oct. 11, 1982, 82 16998

Int. Cl.⁴ H04B *3/20*

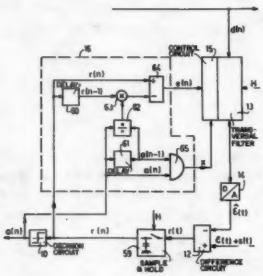
U.S. Cl. 179—170.2 **11 Claims**

6. An echo canceller used in a data transmission modem having a transmit and receive path for cancelling an echo

signal in said receive path produced by a data signal in said transmit path comprising:

means for generating an echo copy signal at a frequency FE at least equal to a frequency of the data in the transmit path including a digital processing circuit connected to said transmit path comprising at least one transversal filter operative at a sampling frequency, and having coefficients which are adjustable to minimize a predetermined function of an error signal corresponding to each filter;

a difference circuit connected to receive signals from said receive path and said echo recopy signal from said at least one transversal filter, whereby an error signal to be reduced by said at least one transversal filter is produced along with a data signal;



a decision circuit connected to said difference circuit for recovering said data signal, said decision circuit producing a data signal having a positive and negative level as a result of a received two level baseband data signal or three level baseband data signal produced by a pseudo-ternary encoding of two level data;

a calculating circuit for modifying the coefficients of said at least one transversal filter according to a control signal Sgn[e(n)] as the sign of the difference or of the sum of the values of the output signal of the difference circuit at actual and previous sampling instants of said at least one transversal filter depending on whether the values of the recovered data signal at the actual sampling instant and at the previous sampling instant have the same or different signs.

4,571,466

SPRING UNIT FOR A KEYBOARD

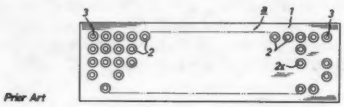
Hideo Iida, Tokyo, Japan, assignor to Kokoku Rubber Industrial Company Limited, Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 638,212

Claims priority, application Japan, Dec. 12, 1983, 58-232879

Int. Cl.⁴ H01H *13/76*

U.S. Cl. 200—5 A **8 Claims**



Prior Art

1. A spring unit for a keyboard comprising:

a base sheet made of a hard resinous or metallic material and having a plurality of openings perforated therein in accordance with a specified key layout; and

a plurality of individual spring members molded from a high polymer resilient material, each member comprising a dome-shaped head portion, an engaging portion adapted to be removably engaged with an opening perforated in the base sheet, a flange having a larger diameter than the diameter of said opening and adapted to enage the lower surface of said base sheet, and a movable contact point adapted to resiliently close an electrical circuit between two fixed contact points on a substrate.

5. A spring unit for a keyboard comprising:

a base sheet made of a hard resinous or metallic material and having a plurality of openings perforated therein in accordance with a specified key layout; and

a plurality of individual spring members molded from a high polymer resilient material, each member comprising a dome-shaped head portion having a cavity, an engaging portion adapted to be removably engaged with an opening perforated in the base sheet, a flange having a larger diameter than the diameter of said opening and adapted to engage the lower surface of said base sheet, and key top assembly having a stem engaging and passing through said cavity, the stem bearing a movable contact point adapted to resiliently close an electrical circuit between two fixed contact points on a substrate.

4,571,467

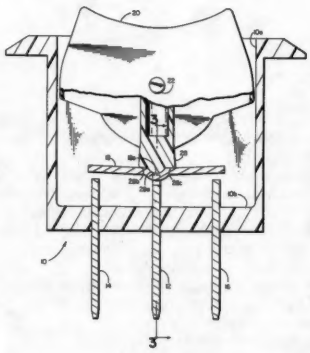
THREE POSITION CENTER-OFF ELECTRICAL SWITCH

Richard W. Sorenson, Avon, and Milton N. Ives, Wolcott, both of Conn., assignors to Carlingswitch, Inc., West Hartford, Conn.

Filed Jul. 26, 1983, Ser. No. 517,422

Int. Cl.⁴ H01H *21/00*

U.S. Cl. 200—6 BA **6 Claims**

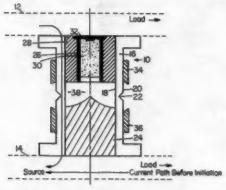


1. An electric switch comprising a base having an upwardly open cavity of elongated rectangular configuration, cavity side walls defining actuator support regions, an actuator including support means cooperating with said support regions to movably support said actuator for limited movement longitudinally of said cavity, a plunger coupled to said actuator and movable in response to such actuator movement, plural fixed contacts provided in slots spaced longitudinally along the bottom wall of said cavity, a movable contact pivotably mounted on top of one such fixed contact, said one contact consisting only of a flat terminal strip, means restricting said movable contact from longitudinal sliding movement relative to said one fixed contact, said plunger having an end portion defining an annular flange engageable spaced portions of said movable contact to support said movable contact pivotably on the upper end of said one fixed contact and out of contact with other of said fixed contacts at least in a center position of said actuator said plunger end portion defining a tip portion surrounded by said annular flange, and said movable contact having a detent surrounded by said annular portion thereof, and biasing means to urge said plunger tip portion into engagement with said movable contact.

4,571,468
INDUCTIVE STORE OPENING SWITCH

William F. Weldon, Austin, Tex., assignor to University of Texas System, Austin, Tex.

Filed Jul. 16, 1982, Ser. No. 399,017
Int. Cl.[4] H01H *39/00*
U.S. Cl. 200—61.08 11 Claims



3. An inductive store opening switch for breaking a connection between a pair of electrical conductors, comprising:

a casing to be disposed between a pair of electrical conductors so as to establish a path for electrical current therebetween;

said casing being scored on its outer surface to establish a rupturing location thereon;

a first body inserted within said casing and disposed adjacent the rupturing location on the casing;

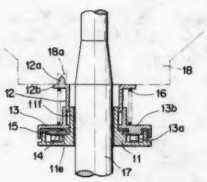
a second body inserted within said casing adjacent the rupturing location on the casing and opposite said first inserted body so as to define a cavity within the casing proximate the rupturing location; and

means for establishing fluid pressure within the cavity in the casing sufficient to produce rupturing.

4,571,469
ROTARY DIRECTION DETECTING SENSOR

Akira Hanaki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 18, 1984, Ser. No. 631,154
Claims priority, application Japan, Jul. 20, 1983, 58-111398[U]
Int. Cl.[4] H01H *3/16, 9/00*
U.S. Cl. 200—61.54 3 Claims



1. A steering wheel rotary direction sensor comprising:

a stationary member fixed to a steering column, said stationary member including a flange section and a cylindrical support section, said flange section having a first side and a second side, said cylindrical support section extending centrally from said first side of the flange section to support a steering shaft therethrough, said first side of the flange section carrying a plurality of stationary contacts arranged thereon along a common circle;

a rotor member rotatable together with the steering wheel, said rotor member being concentrically provided around said cylindrical support section rotatably in first and second directions and having an arcuate extention projecting toward said first side t0 extend along said common circle, said arcuate extension carrying a first movable contact to selectively contact said plurality of stationary contacts; and

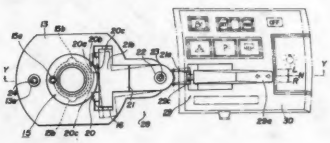
a substantially circular follower member concentrically provided around said cylindrical support section, said substantially circular follower member having a cut-out portion to form a first end face and a second end face, said first and second end faces facing each other across a gap therebetween, said gap having a larger angular size than said arcuate extension, said substantially circular follower member carrying a second movable contact to selectively contact said plurality of stationary contacts on the first side of the stationary member, said arcuate extension extending between said first and second end faces of the substantially circular follower member;

said rotor member actuating the substantially circular follower member in said first and second rotary directions, said first movable contact and second movable contact taking first and second angular positions during said actuation in said respective rotary directions, said plurality of stationary contacts including a common contact and first, second and third selective contacts, said first movable contact being selectively in contact with the second selective contact in said first angular position and with the first selective contact in said second angular position, said second movable contact being selectively in contact with the second selective contact in said second angular position and with the third selective contact in said first angular position, said first and second movable contacts being in constant contact with said common contact.

4,571,470
TURN SIGNAL SWITCHING DEVICE

Yoshio Hattori, Kawasaki, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1983, Ser. No. 482,249
Claims priority, application Japan, Apr. 13, 1982, 57-053547[U]
Int. Cl.[4] H01H *9/00*
U.S. Cl. 200—61.54 3 Claims



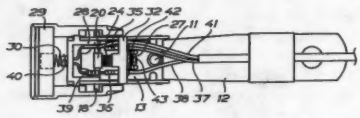
1. A turn signal switching device in an automobile comprising: a supporting member fitted onto the periphery of a steering shaft; a cancel rotor spring-inserted to said supporting member and supported in a freely rotatable status and rotated together with the rotating operation of a steering wheel of said automobile; a cancel cam retained at a predetermined position of the supporting member in a freely swingable state horizontally and placed to engage with said cancel rotor at a given position; a control lever retaining said cancel cam at one end, fitting an intermediate portion onto said supporting member in a freely swingable state to drive the cam to said predetermined position as desired, and forming a cut groove engaging with a drive shaft of a turn signal switch at another end; and a turn signal switch mountable freely on a desired position to transfer said cancel cam to a desired given position by driving the said control lever engaged with the cut groove.

4,571,471

VEHICLE SAFETY BELT LOCK HAVING AN ELECTRIC CONTACT

Lennart Haglund, Vårgårda, Sweden, assignor to AB Stil-Industri, Vårgårda, Sweden

Filed Mar. 5, 1984, Ser. No. 586,024
Claims priority, application Sweden, Mar. 3, 1983, 8301163
Int. Cl.[4] H01H 3/16
U.S. Cl. 200—61.58 B 6 Claims



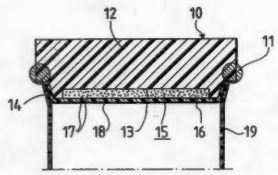
1. A device in vehicle safety belt locks comprising a lock member for engagement with a lock tongue, said lock member being pivotable between engaged and disengaged positions, an ejector, spring means biasing the ejector which is displaceable against the spring bias by the insertion of said lock tongue said biasing spring means comprising a helical spring operatively engaged between the ejector and the lock member, a guide projection receiving one end of said spring, and an electric contact means including stationary contact members and a movable contact member, said movable contact member being mounted for rocking movement on said guide projection at said one end of the spring to be engaged with and disengaged from the stationary contact members by a rocking movement of the movable contact members, caused by the spring as the ejector is moved against and by the spring bias, respectively.

4,571,472

DEVICE FOR INDUCTION WELDING

Zoltan Pollack, and Bengt Svärd, both of Lund, Sweden, assignors to AB Akerlund & Rausing, Sweden

Filed Dec. 24, 1984, Ser. No. 685,485
Claims priority, application Sweden, Jan. 24, 1984, 8400345
Int. Cl.[4] H05B 6/40
U.S. Cl. 219—9.5 9 Claims



1. A device for induction welding comprising:

conductor means for receiving current from a high frequency source and establishing a magnetic field in a defined area where articles are to be joined by virtue of heat generated in at least a conductive portion of said particles to be joined as a result of said magnetic field, said conductor means being positioned to produce said magnetic field in said defined areas as a result of current flowing therein; and

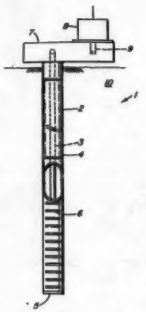
a magnetic field modifying layer positioned intermediate at least portions of said conductor means and said defined area for interacting with said magnetic field and shielding a predetermined region of said defined area, said magnetic field conductive modifying layer taking the form of substantially non-magnetic particles disbursed in a support matrix formed of electrically non-conducting material.

4,571,473

MICROWAVE APPLICATOR FOR FROZEN GROUND

Walter Wyslouzil, Gloucester, and Satish C. Kashyap, Kanata, both of Canada, assignors to Canadian Patents & Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee, Ottawa, Canada

Filed Jun. 14, 1984, Ser. No. 620,669
Claims priority, application Canada, Jun. 14, 1983, 430349
Int. Cl.[4] H05B 6/72
U.S. Cl. 219—10.55 A 9 Claims



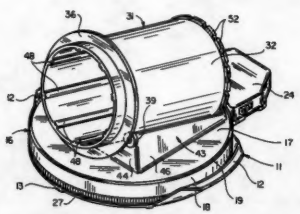
1. In an apparatus for thawing frozen ground by use of microwave energy a microwave applicator comprising a coaxial transmission line having an inner conductor, and an outer conductor, an array of regularly spaced apertures in the outer conductor, the distance between the centers of adjacent apertures being selected to minimize internal reflections and maximize radiation, a layer of low-loss material covering said apertures, means coupling the transmission line to a source of microwave energy; and a conductive plate covering the end of said transmission line remote from the source of microwave energy.

4,571,474

MICROWAVE OVEN ROTISSERIE AND STIRRER

James F. Pomroy, East St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Apr. 18, 1984, Ser. No. 601,617
Int. Cl.[4] H05B 6/78
U.S. Cl. 219—10.55 F 14 Claims



1. In apparatus for holding a food product to be heated in a microwave oven: a base, a platform mounted on the base for rotation about a vertically extending axis, a food holding container of generally circular cross-section mounted on the platform with the axis of the container being inclined at an angle relative to the vertically extending axis, drive means mounted on the base for rotating the platform and the inclined container about the vertically extending axis, a peripheral ring of gear teeth on the lower end of the container, and a ring of gear teeth mounted in a stationary position on the base in meshing engagement with the gear teeth on the container for turning the

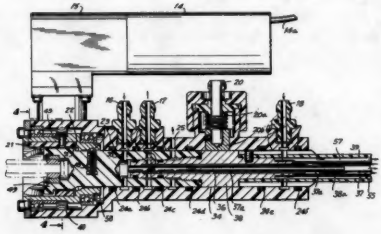
container about the inclined axis as the container and the platform rotate about the vertically extending axis.

4,571,475

INTERNAL BORE WELDING TORCH HAVING REMOVABLE FLEXIBLE WAND FOR REMOTE WELDING

George B. Rabe, Sparta, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 27, 1984, Ser. No. 604,557
Int. Cl.[4] B23K *9/225*
U.S. Cl. 219—60 A **11 Claims**



1. An internal bore welding torch assembly adapted for making welds in remote locations, said torch assembly comprising:

(a) a torch body unit, including connection means attached to said body for supplying flows of a cooling fluid, shield gas, and electric power to the body unit, said body unit having a central cylindrical-shaped opening therein for receiving an elongated welding wand unit in slidable engagement therein;

(b) an elongated flexible welding wand unit removably and rotatably received in said torch body unit, said elongated wand containing a welding electrode oriented radially at the wand outer end, longitudinal passage means located within said wand for providing flow of coolant and shield gas from said body unit to said electrode, and elongated flexible electrical connection means for supplying electrical power to said electrode; and

(c) drive means associated with said torch body unit for rotating the removable welding wand unit at a controlled rate while supplying said cooling fluid, shield gas and electric power to said electrode during making an arc weld at the remote location, said drive means including an electric motor and gear reducer mounted on said torch body unit at the rear portion thereof, said gear reducer including splines for contacting said removable wand unit.

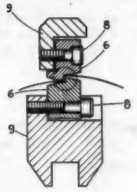
4,571,476

DEVICE FOR POSITIONING METAL ENDS TO BE LAP WELDED ONE TO THE OTHER

Luigi Pazzaglia, Bologna, Italy, assignor to Cefin S.p.A., Bologna, Italy

Filed Sep. 5, 1984, Ser. No. 648,003
Claims priority, application Italy, Sep. 26, 1983, 3567 A/83
Int. Cl.[4] B23K *11/06*
U.S. Cl. 219—61.3 **4 Claims**

1. Device for positioning metal edges which are to be lap welded one to the other, comprising two oppositely disposed slots for receiving said metal edges and bringing them together in overlapping relationship to be welded and for defining the position for the welding of the said metal edges, wherein the said slots are defined by at least one pair of guide blocks that are substantially opposed and are shaped in the form of a step in such a way that each guide block defines an abutment for one of the said metal edges and said guide blocks define there-



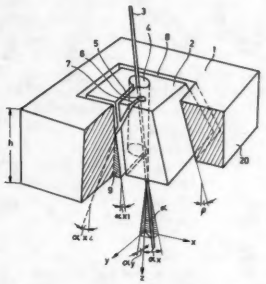
between opposed pairs of supporting surfaces for both of the said metal edges.

4,571,477

METHOD FOR SECURING CUT PIECES IN SPARK EROSIVE CUTTING

Benno Weber, Porto Ronco, Switzerland, assignor to AG fur industrielle Elektronik Agie, Losone bei Locarno, Switzerland

Filed Jun. 6, 1984, Ser. No. 617,628
Claims priority, application Switzerland, Jun. 9, 1983, 3173/83
Int. Cl.[4] B23P *1/12*
U.S. Cl. 219—69 M **4 Claims**



1. In the spark erosive cutting of a conductive workpiece by a tool electrode under the control of a digital tool control system, the method of securing to the workpiece a workpiece part which is to be cut from the workpiece along a preprogrammed cutting path where the workpiece part is secured to the workpiece by a web of workpiece material extending between the workpiece and the workpiece part in which the preprogrammed cutting path comprises first and second intersecting cutting paths of different cutting angles, characterized in that in a first traverse of the cutting path a first erosion treatment is performed by the tool electrode leaving a portion of the cutting path uncut to initially form the web; subsequently the tool electrode performs at least one additional erosion treatment along the cutting path; and before completing a final erosion treatment along the preprogrammed cutting path the tool electrode is passed through a modified cutting angle setting to maintain a residual web section of a workpiece material between the workpiece and the workpiece part, said residual web section extending only over part of the height of cut in the workpiece and being configured so that it may be broken and the workpiece part detached from the workpiece upon application of a predetermined breakoff force.

4,571,478

ELECTRODE DRIVE AND NOZZLE SYSTEM FOR AN AUTOMATIC AIR CARBON-ARC CUTTING AND GOUGING TORCH

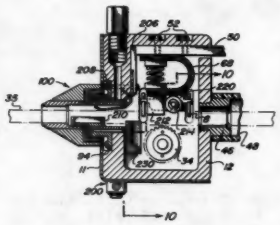
David E. Johnson; Larry A. Abersold, and Kenneth E. McCall, all of Lancaster, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 487,351, Apr. 21, 1983. This application May 10, 1984, Ser. No. 609,048

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] B23K *9/28*

U.S. Cl. 219—69 R **28 Claims**



1. In an automatic air carbon-arc cutting and gouging torch of the type adapted for positioning at a fixed position relative to a workpiece and having a means for supporting a consumable electrode juxtaposed to a workpiece, means for directing air along said electrode and means for continuously feeding successive jointed lengths of electrode to said workpiece as said electrode is consumed, the improvement comprising:

a housing fabricated from an electrically insulating structural material having an inlet aperture and an outlet aperture aligned therewith to permit electrode movement through said housing;

means mounted on said housing to cause rotation of a drive wheel adapted to frictionally engage an electrode and move said electrode through said housing;

an electrical contact shoe juxtaposed to said drive wheel and positioned by a clamping lever, said lever having means to bias said shoe toward said electrode to make intimate contact with said electrode while adapted to release said electrode by movement of said lever;

an electrode support positioned to support said electrode between said drive wheel and a nozzle assembly mounted in said outlet aperture of said housing said support including means to reposition said electrode to said support when said electrode is temporarily moved out of position on said support during operation of said torch; and

said nozzle assembly including means to direct air in a semicircular cross-sectional pattern along said electrode toward said workpiece; whereby if said electrode is driven into said workpiece said electrode can pivot on said drive wheel and move out of said support to thus prevent breaking of said electrode inside said housing.

4,571,479

WELDING MACHINE WITH AUTOMATIC SEAM TRACKING

Susumu Maeda; Masakazu Taki, and Kenji Yoshizawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1984, Ser. No. 588,418

Claims priority, application Japan, Mar. 14, 1983, 58-41802; Mar. 30, 1983, 58-54143; Jul. 26, 1983, 58-136304

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.34 **9 Claims**

1. An automatic tracking welding machine, comprising:

(a) an electrical arc generating welding torch (**3**) movably mounted relative to two objects (**5**) to be welded together and disposed opposite a weld line gap (**10**) defined by and between said objects;

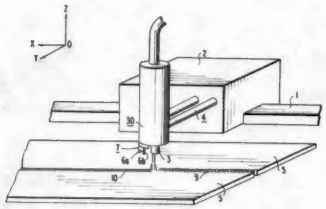
(b) a pair of magnetic detectors (*6a, 6b*) for detecting magnetic flux exclusively generated in the objects by the electrical arc current and leaking from said gap;

(c) means (**7, 40, 13**) for rotatably mounting said detectors on a circle coaxial with said welding torch and circumferentially spaced from each other;

(d) drive means (**15**) for rotating said magnetic detectors via said mounting means;

(e) a control circuit (**100**) for producing and applying a drive signal to said driving means in response to output signals from said magnetic detectors to rotate said detectors to a centered position flanking the gap whereat their output signals are equal;

(f) a rotary encoder (**16**) coupled to the drive means for producing an output proportional to the angle of rotation thereof; and



(g) means for:

(1) determining x and y coordinates of the centered detectors position on the basis of the encoder output and the radial distance between the torch and the detectors, and

(2) displacing said welding torch to said determined coordinates such that said welding torch tracks the weld line gap,

wherein said control circuit includes a comparator circuit (**101**) for comparing the output signals of said detectors, and a velocity instruction circuit (**102, 103**) responsive to the output of said comparator circuit for producing a first drive signal to drive said detectors at a predetermined high velocity in a direction to decrease any detector output difference when said difference exceeds a predetermined value, and a second drive signal to drive said detectors at a lower velocity corresponding to said difference when said difference is smaller than said predetermined value.

4,571,480

FLUX CORED WIRE ELECTRODES FOR SELF-SHIELDED ARC WELDING

Yoshiya Sakai; Yasuhiro Nagai; Kazuo Ikemoto, all of Kanagawa; Tetsuo Suga, Yokohama, and Masaharu Sato, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

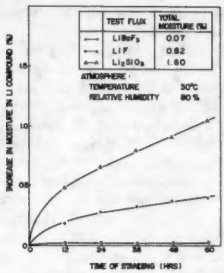
Filed Feb. 27, 1984, Ser. No. 583,607

Int. Cl.[4] B23K *35/368*

U.S. Cl. 219—146.3 **8 Claims**

1. A flux cored wire electrode for self-shielded arc welding which comprises a steel sheath and a powdery flux containing as essential components the components given below, said sheath being filled with said flux and the amount of said flux being 15–30 percent by weight based on the whole wire electrode weight:

BaF_2:	25–70 percent by weight
Alkali metal fluoride:	1–30 percent by weight
Compound oxide composed of the oxide of an alkaline earth metal selected from the group consisting of Ca, Sr	



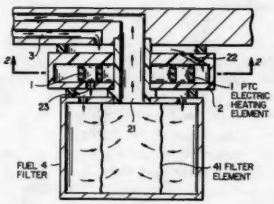
-continued

and Ba and the oxide of a metal selected from the group consisting of Fe, Mn, Ni, Co, Ti, Al and Zr:	1–30 percent by weight
Al:	3–12 percent by weight
Mg:	2–10 percent by weight
Mn:	0.5–10 percent by weight.

4,571,481
METHOD AND APPARATUS FOR ELECTRICALLY HEATING DIESEL FUEL

David F. Leary, Woodside, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 474,390, Mar. 11, 1983, Pat. No. 4,529,866. This application May 1, 1984, Ser. No. 606,033
The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.
Int. Cl.[4] F02M *31/12;* F24H *1/10;* H05B *3/14*
U.S. Cl. 219—205 9 Claims



1. Apparatus for heating diesel fuel, the apparatus comprising

(1) a container having entry and exit ports for passing the diesel fuel through the container; and

(2) an electrical heater which

(i) is positioned within the container;

(ii) comprises;

(a) an elongate unjacketed heating element composed of an electrically conductive polymer composition which exhibits PTC behavior, and

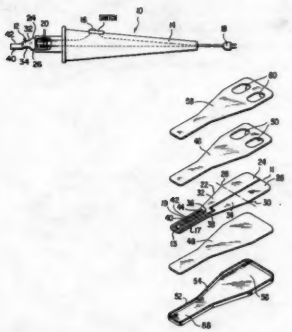
(b) at least two electrodes which can be connected to a source of electrical power to cause current to pass through the heating element; and

(iii) the exterior surface of the elongate heating element being exposed so that it is directly contactable by the diesel fuel passing through the container.

4,571,482
ELECTRIC RESISTANCE HEATER ASSEMBLY FOR SOLDERING AND DESOLDERING DEVICES

Alan D. Vogel, Columbia, Md., assignor to Pace, Inc., Laurel, Md.

Filed Oct. 27, 1983, Ser. No. 546,173
Int. Cl.[4] H05B *3/30;* H01C *1/02;* B23K *3/02*
U.S. Cl. 219—237 14 Claims



1. A strip heater assembly comprising:

an elongated resistance element formed from a thin flat metal foil and having a proximal end and a distal end, the resitance element including three connected areas of differing resistance where (a) the first area includes first and second end portions spaced from one another in side-by-side relationship at said proximal end and respectively adapted for connection to a source of electrical energy, (b) the second area decreases in width from the first area to the third area, the second area including first and second portions spaced from one another and each having first and second ends respectively connected at the first ends thereof to the first and second portions of the first area, and (c) the third area having a width no greater than the smallest width of the second area and including first and sesecond strips respectively connected at one end thereof to the second ends of said first and second portions of the second area, said first and second strips being spaced from one another and extending from a first position at said second ends of said portions of said second area to the distal end of the resistance element and then back towards said second area to a second position spaced from the distal end and located in the third area, the other ends of said first and second strips being connected to one another at said second position, said strips being in a continuous side-by-side relationship at least at said distal end, said third area having a higher electrical resistance than said second area, and said second area having a higher electrical resistance than said first area such that said third area is adapted to apply heat to a work and said first area acts as a heat sink due to the gradual decrease in generated heat occurring in the tapered second area; and

means for enclosing said resistance element to electrically isolate it from said work.

4,571,483
PORTABLE STEAMER

Saul S. Fathi, Huntington, N.Y., assignor to Traveltec International, Inc., Great Neck, N.Y.

Filed Jul. 30, 1984, Ser. No. 635,554
Int. Cl.[4] A47J *51/00*
U.S. Cl. 219—271 10 Claims

1. A steamer device comprising:

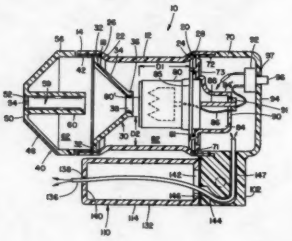
a cylindrical casing open at opposite ends;

a handle pivotally attached to said casing for holding said casing said handle moveable in either of two positions respectively perpendicular and parallel to said casing;

a baffle attachable to one end of said casing, said baffle being quickly removable for filling said casing with water to be turned into steam, said baffle having a plurality of perforations extending from a front end to an open rear end of said baffle for passing said steam from said casing, and an open ended flattened tube extending substantially across the diameter of said cylindrical casing inside said baffle and aligned with said perforations;

a cap secured to and closing the other end of said casing;

a heater assembly in said casing for generating said steam therein;



a bracket supporting said heater assembly in said casing and closing a rear end of a first chamber wherein said steam is generated; and

a funnel shaped partition defining a front end wall for closing a front end of said first chamber and for containing said water therein which is to be turned into steam by said heater assembly, said funnel shaped partition having a central opening aligned with said flattened tube for passing said steam through said partition and through said baffle while retaining said water in said first chamber, said funnel shaped partition arranged to direct any of said water which may spill out of said first chamber around the outside of said flattened tube in said baffle and thereby prevent water from spilling out of said steamer.

4,571,484

MECHANISMS TO HEAT FLUIDS TO HIGHER TEMPERATURES AND PRESSURES

Peter Singfield, South Stukely, Canada, assignor to Dicore Resources, Ltd., Calgary, Canada

Continuation of Ser. No. 332,315, Dec. 18, 1981, which is a continuation of Ser. No. 136,116, Mar. 27, 1980, abandoned.
This application Mar. 2, 1984, Ser. No. 585,522
Claims priority, application Canada, Apr. 2, 1979, 324594
Int. Cl.[4] F22B *1/06*; F24H *7/02*
U.S. Cl. 219—271 **22 Claims**

1. A boiler comprising:

(a) a housing, a boiler tube in said housing, a mass of meltable metal in said housing surrounding said boiler tube and being in heat exchange relationship therewith;

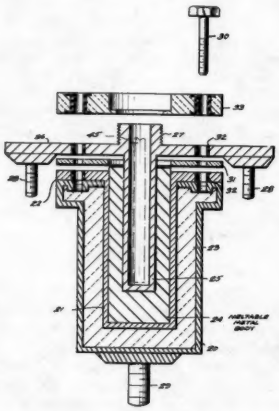
(b) means for providing an electric current through said metal capable of melting said metal by heat generated by the resistance of said metal to said electric current;

(c) means for injecting water into said boiler tube, whereby said water is heated to the melting point temperature of said metal and said metal is at least partially solidified thereby releasing heat in an amount associated with the heat of fusion of said metal which is transferred to said water to generate steam; and

(d) means for releasing steam generated in said boiler; and wherein said means for injecting water into said boiler tube and for releasing steam generated in said boiler are comprised of valve means including:

(1) a valve body defining a water inlet port, a steam exit port and a valve stem chamber in communication with said water inlet and steam exit ports;

(2) an elongated valve stem including means defining an axial passageway which terminates at a distal end of said valve stem, means defining an access port in communication with said passageway, and means defining an exterior surface which reduces the cross-sectional diameter of a portion of said valve stem; said valve stem being mounted in said valve stem chamber such that said valve stem distal end extends from said valve body, said valve stem being movable in said valve stem chamber between (i) a first position, wherein said access port establishes fluid communication between said water inlet port and said passageway, and (ii) a second position, wherein fluid communication is established between said passageway and said steam exit port by



virtue of the reduced cross-sectional diameter of said valve stem portion;

(3) means to rigidly mount said valve body to said boiler tube such that said distal end of said valve stem extends into said boiler tube; and

(4) control means coupled to said valve stem for controlling movement of said valve stem between said first and second positions, said control means including means for exerting a bias force on said valve stem to bias said valve stem into said first position to cause said water to flow into said boiler tube through said valve stem passageway thereby generating steam in said boiler tube and for permitting said valve stem to move into said second position in response to pressure of said generated steam exceeding said bias force to thereby permit ejection of said steam from said boiler tube through said steam exit port.

4,571,485

CUBE TYPE AROMA GENERATOR

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

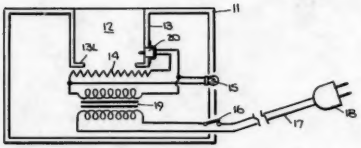
Filed Oct. 25, 1984, Ser. No. 664,536
Int. Cl.[4] F22B *1/28*
U.S. Cl. 219—276 **9 Claims**

1. An aroma generator for discharging aromatic vapors into the atmosphere, said generator comprising:

A. a replaceable aroma source formed by an open-ended chimney having a shallow box coaxially supported therein adjacent its lower end to form a space between the box and the chimney, an underside of the box being open, said box having a porous pad nested therein impregnated with an aromatic liquid, a surface of the pad being exposed by the open underside of the box, said box having a top wall provided

with a center hole which extends through the pad to define an air inlet passage, the space between the chimney and the box defining an outlet air passage; and

B. a heater unit having a well therein for receiving said chimney and having an electrical heater element disposed below the well whereby when the heater element is energized, it heats and expands air thereabove to create a differential



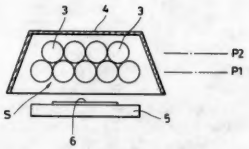
pressure in the chimney causing cool air above the top wall of the box to be drawn through the inlet passage toward the heater element to be heated, thereby producing hot air convection currents that pass across the exposed surface of the pad to volatilize the liquid to form aromatic vapors that flow through the outlet passage to be discharged into the atmosphere.

4,571,486

HEATING METHOD OF SEMICONDUCTOR WAFER

Tetsuji Arai, Tachikawa, and Yoshiki Mimura, Yokohama, both of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,259
Claims priority, application Japan, Mar. 16, 1983, 58-42203
Int. Cl.[4] F24H *3/00*
U.S. Cl. 219—354 **3 Claims**



1. A method for heating a semiconductor wafer having a first region to be heated and a second region requiring no heating thereof, which method comprises forming a film over at least one of the first and second regions so as to make the reflectivity of the surface of the first region smaller than the reflectivity of the surface of the second region, and then exposing the semiconductor wafer to a flash of light to heat same.

4,571,487

METHODS AND APPARATUS FOR SUPPLYING ELECTRICAL POWER FOR PROXIMITY EFFECT HEAT-TRACING

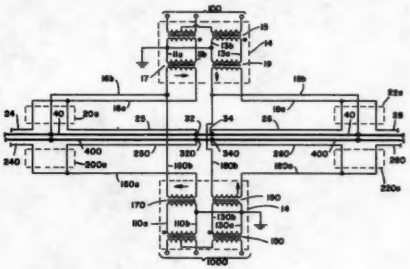
Paul F. Offermann, Redwood City, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1983, Ser. No. 537,994
Int. Cl.[4] H05B *1/02, 1/00*
U.S. Cl. 219—482 **17 Claims**

1. Apparatus for supplying alternating electrical current from a common power source to a plurality of proximity effect heat-tracing circuits, each circuit heating one of a plurality of generally serially connected pipeline segments, comprising:

a main power station comprising a main step-down transformer having at least one primary winding coupled to the alternating current power source and at least one secondary winding for supplying power to a plurality of heat-tracing circuits;

a plurality of subsidiary stations spaced apart from each other and from said main station at selected distances along said pipeline, each of said subsidiary stations being coupled external to said pipeline to said secondary winding of said main station transformer as a common current source, and each of said subsidiary stations being coupled



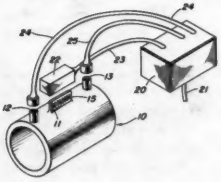
to at least a pair of said plurality of proximity effect heat-tracing circuits so that one of said pair of circuits extends along said pipeline away from said main station and the other of said pair of circuits extends along said pipeline toward said main stations whereby said main power station separately supplies at least two of the four proximity effect circuits with alternating current at substantially reduced voltage or current, or both to heat the same length of said pipeline.

4,571,488

HEAT-FUSION PIPE FITTING SYSTEM

Anthony V. Reeves, Nottingham, England, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1985, Ser. No. 696,198
Int. Cl.[4] H05B *3/58*
U.S. Cl. 219—544 **28 Claims**



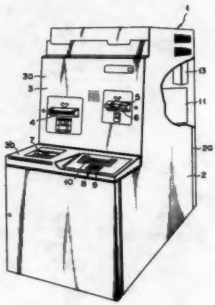
1. A thermoplastic heat-fusion pipe fitting system comprising a thermoplastic heat-fusion pipe fitting having a body portion to accommodate pipe and a shaped portion bearing a code indicative of the amount of heat required to effect the fusion of the fitting, means for heating said fitting associated with the fitting, means for sensing and decoding the code, and control means responsive to information decoded from the code for regulating the amount of heat applied by the heating means to the fitting.

4,571,489

AUTOMATIC BANK NOTE TRANSACTION APPARATUS

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 1, 1983, Ser. No. 510,164
Claims priority, application Japan, Jul. 12, 1982, 57-121028
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 6 Claims



1. An automatic bank note transaction apparatus which stores deposited notes together with previously stored notes and appropriate the deposited notes for dispensation, comprising:

a housing having note inlet/outlet means;

a plurality of note storage means provided in the housing, and including first note storage means for storing the deposited notes and second note storage means for storing notes which are left unreceived in the note inlet/outlet means at the time of depositing or dispensation;

conveyor means for transferring notes between the note inlet/outlet means and individual note storage means;

judgment means attached to the conveyor means for for detecting fit and unfit conditions of notes being transferred from the note inlet/outlet means to the note storage means nad dor generating fit and unfit detection signals, respectively; and

diverging means connected to said judgment means and operatively associated with the individual note storage means to direct the notes transferred from the note inlet/-outlet means by the conveyor means to corresponding ones of the note storage means in dependence upon the receipt of said fit or unfit detecting signals from said judgment means, wherein said diverging means, in response to receiving said fit detection signal, for directing to the first note storage means those deposited notes which are judged fit by the judgment means, and those notes which are left unreceived in the note inlet/outlet means and recovered, and wherein

said diverging means, in response to receiving said unfit detection signal, for returning to the note inlet/outlet means those deposited notes which are judged unfit by the judgment means, and directing to the second storage means those unfit notes which are left unreceived in the note inlet/outlet means and recovered.

4,571,490

PARKING STATION SUPERVISORY SYSTEM

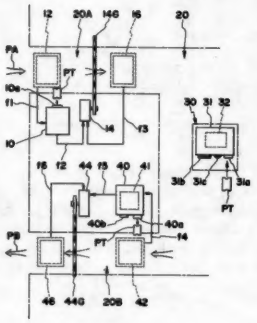
Komine Hidemi, and Kato Hiroshi, both of Yokohama, Japan, assignors to Amano Corporation, Yokohama, Japan

Filed Apr. 9, 1984, Ser. No. 598,452
Claims priority, application Japan, Apr. 7, 1983, 58-61668
Int. Cl.[4] G07B *15/02*
U.S. Cl. 235—384 7 Claims

1. A parking station supervisory system comprising:

a vehicle entry detector provided at an entrance of the parking station;

an automatic ticket issuance device installed close to said entrance, said automatic ticket issuance device issuing a ticket responsive to a detecting signal sent from said vehicle entry detector and when the ticket is pulled out of a ticket pocket, an entrance gate bar being opened responsive to an opening signal sent from said automatic ticket issuance device enabling a vehicle to enter;



a parking fee adjusting device installed at an adequate place for reading the entry time recorded on the ticket inserted therein in order to calculate a parking fee and recording an allowable departure time on the ticket upon payment of the parking fee; and

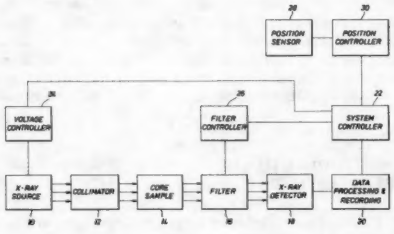
a vehicle departure control device installed close to an exit of the parking station for reading the allowable departure time recorded on the ticket inserted therein and opening an exit gate bar only when the present time is within the allowable departure time, by sending an opening signal thereto.

4,571,491

METHOD OF IMAGING THE ATOMIC NUMBER OF A SAMPLE

Harold J. Vinegar, and Scott L. Wellington, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 29, 1983, Ser. No. 566,618
Int. Cl.[4] G01D *18/00*
U.S. Cl. 250—252.1 24 Claims



1. A method of obtaining an atomic number image of an unknown material, said method comprising the steps of: scanning a plurality of calibration materials with a computerized axial tomographic scanner (CAT) at a first energy, said plurality of calibration materials having a plurality of different known atomic numbers, Z_i, and densities, ρ_i; scanning said plurality of calibration materials with a CAT at a second energy; determining from attenuation coefficients from reconstructed images of said plurality of calibration materials at said

first and second energies two energy-dependent coefficients, a and b, at said first and second energies according to the following equation

$$\mu_i = aZ^m\rho_i + b\rho_i$$

where

μ_i: attenuation coefficient for the i^{th} calibration material

a: energy-dependent coefficient

Z_i: atomic number for the i^{th} calibration material

m: constant in the range of 3.0–4.0

ρ_i: electron density for the i^{th} calibration material

b: energy-dependent coefficient; and scanning said unknown material with a CAT at said first energy; scanning said unknown material with a CAT at said second energy; and using said two determined energy coefficients and attenuation coefficients from reconstructed images for said unknown material at said first and second energies to determine an atomic number image of said unknown material.

4,571,492

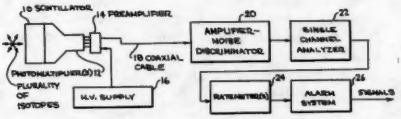
METHOD TO DETECT, IDENTIFY, AUTHENTICATE AND DATE AN ARTICLE

Noel S. Kane, 14611 Aloha Ave., Saratoga, Calif. 95070; Jack L. Robbins, Rte. 1, Box 41B, Brentwood, Calif. 94513, and Melvin S. Coops, 1657 Third St., Livermore, Calif. 94550

Filed Sep. 29, 1982, Ser. No. 426,882

Int. Cl.[4] G01T *1/161*; G21H *5/02*

U.S. Cl. 250—303 **8 Claims**



1. A method for identifying, authenticating and detecting unauthorized movement of one or more electronic components, comprising:

disposing a predetermined amount of an initially disposed radioactivity from a plurality of radioisotopes on said article, said plurality of radioisotopes having an identifiable characteristic gamma spectrum unique to said plurality comprising a two-tier gamma spectrum having a majority of initially disposed radioactivity possessing a shorter total half-life than a total half-life of a remaining minority of said initialy disposed radioactivity;

providing means for detecting said characteristic gamma spectrum, said detecting means emitting a discernible signal responsive to unauthorized movement of said article; and

detecting such characteristic gamma spectrum in reponse to said movement at initial times and subsequent times.

4,571,493

RADIATION IMAGE READ-OUT METHOD

Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanawaga, Japan

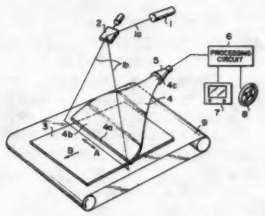
Filed Jun. 18, 1984, Ser. No. 621,652

Claims priority, application Japan, Jun. 16, 1983, 58-108238

Int. Cl.[4] G03C *5/16*

U.S. Cl. 250—327.2 **5 Claims**

1. A method of reading out a radiation image in which a stimulable phosphor sheet carrying a radiation image of an object stored therein is scanned by stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the radiation energy stored therein, and the emitted light is photoelectrically detected by use of a photodetector via a light guide member to obtain an electric image signal of said radiation image, wherein the improvement comprises obtaining said electric image signal of said radiation image by subtracting a signal amount corresponding to after-glows emitted by said stimulable phosphor sheet and photoelectrically detected by use of said photodetector via said light guide member when said stimulating rays are not present on said stimulable phosphor sheet after said stimulable phosphor sheet is scanned at least by one scan line by said stimulating rays from an amount of electric image signal photoelectrically detected by said photodetector via said light guide member when said stimulable phosphor sheet is scanned by said stimulating rays.



4,571,494

MULTI-CHANNEL RADIATION DETECTOR ARRAY

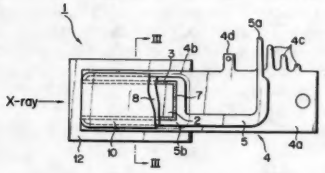
Masayuki Nishiki, and Toshihiro Rifu, both of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,271

Claims priority, application Japan, Mar. 31, 1982, 57-51363

Int. Cl.[4] G01T *1/24*

U.S. Cl. 250—370 **6 Claims**



1. A radiation detector comprising:

a pair of support members set apart in a direction perpendicular to an incident radiation, each support member having a face facing the other support member and a plurality of grooves cut in the face, said grooves being juxtaposed at predetermined intervals along an arc, the center of which is a source of said radiation, extending along the incident rays of said radiation and aligned to the grooves of the other support member; and

a plurality of detector units supported by the support members and juxtaposed along said arc, each of said detector units comprising:

a base plate having a notch in a side thereof facing the radiation source;

a plate-like detector element, fitted and secured in the notch of said base plate, for detecting the incident radiation rays, two major surfaces of said detector element being parallel with those of the base plate which is thinner than the detector element;

two electrode layers formed on and electrically connected to the two major surfaces of said detector element, respectively;

a retaining plate holding, by using an adhesive material, the detector element at one of the major surfaces thereof, the ends of said retaining plate being engaged in one of the grooves cut in one support member and in that groove cut

in the other support member which is opposite to said groove; and

two lead electrodes formed on and electrically connected to the major surfaces of said base plate, respectively.

4,571,495

MEASUREMENT SYSTEM UNIT FOR A COMPUTER TOMOGRAPH

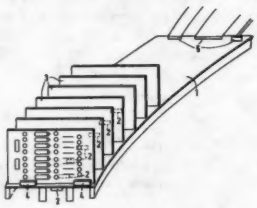
Walter Distler, Erlangen, and Fritz Peter, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,912

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 8308842[U]

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—394 **3 Claims**



1. In a measuring sytem unit for a tomography computer having a holder for carrying a plurality of individual detectors, as well as a channel electronic system assigned to each individual detector, the improvement wherein said holder comprises a carrier plate on one side of which the individual detectors are mounted, and on the other side of which are mounted a plurality of electronic boards, each of said electronic boards carrying the channel electronic system of a respective one of said detectors that is located opposite to it.

4,571,496

RADIATION IMAGE STORAGE PANEL

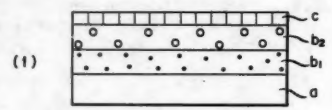
Satoshi Arakawa; Hisashi Yamazaki; Kikuo Yamazaki, and Terumi Matsuda, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jan. 31, 1984, Ser. No. 575,669

Claims priority, application Japan, Jan. 31, 1983, 58-14189

Int. Cl.⁴ G21K *4/00*

U.S. Cl. 250—484.1 **10 Claims**



1. A radiation image storage panel comprising a support having a support side and phosphor layers provided thereon which comprise a binder and a stimulable phosphor dispersed therein, characterized in that said phosphor layers comprise a first phosphor layer on said support side and a second phosphor layer provided on said first phosphor layer, and that the mean particle size of the stimulable phosphor contained in said first phosphor layer is smaller than the mean particle size of the stimulable phosphor contained in the second phosphor layer, said stimulable phosphor contained in said first phosphor layer being the same as said stimulable phosphor contained in said second phosphor layer.

4,571,497

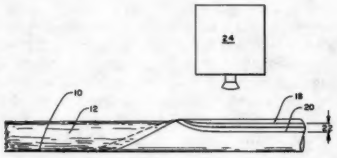
METHOD FOR CONTINUOUSLY MEASURING THE PERIMETER OF WRAPPED OBJECTS

James W. Henry, Kingsport, and Robert C. Mumpower, Gray, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1982, Ser. No. 409,754

Int. Cl.⁴ A24C *1/42*; F16H *9/12*

U.S. Cl. 250—560 **10 Claims**



1. Method of continuously determining the perimeter of an elongated object of generally uniform cross section which comprises

wrapping said object with a sheet of flexible material having a pair of detectable parallel lines formed thereon, such that said parallel lines extend generally axially parallel to said object,

placing detection means in position to detect said lines, said detection means having means for determining the distance between said lines,

moving said object and said detection means relative to each other in a manner such that continuous detection of said lines and measurement of the distance therebetween occurs, and

correlating the measured distance between the lines to the perimeter of said object.

4,571,498

APPARATUS FOR INTERROGATING PHOTOTRANSISTORS AND THE LIKE

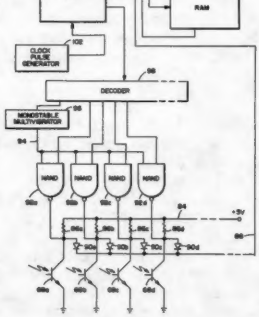
James C. Hagan, and Owen C. Hagan, both of Stockton, Calif., assignors to Hagan Engineering, Inc., Stockton, Calif.

Division of Ser. No. 395,804, Jul. 6, 1982, Pat. No. 4,490,801.

This application Oct. 24, 1984, Ser. No. 664,316

Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—560 **5 Claims**



1. A circuit for rapidly interrogating a plurality of phototransistors that are randomly subject to illumination to determine which phototransistors have been illuminated, the photo-

transistors each having an emitter, a collector and a base and being constructed and arranged so that impingement of photons at the base reduces resistance to current flow between the collector and emitter in proportion to the number of photons impinging on the base, the circuit comprising a power source, means for coupling said power source to the collectors of respective said phototransistors, said coupling means including a dropping resistor in series with said power source and said collector so that the voltage level at said collector is a function of the number of photons impinging on said base, a plurality of gating means corresponding in number to the number of phototransistors, there being an individual gating means associated with each individual phototransistor, each said gating means having an output coupled to said collector of the phototransistor with which the gating means is associated, said output having a normal voltage level that is substantially equal to the voltage level on said emitter so as to permit accumulation in said base of current carriers arising from photon impingement thereon, means for supplying an interrogating voltage pulse to each said gating means in sequence so as to vary said normal voltage level and cause current flow between said collector and emitter in proportion to the number of photons having impinged on the base, the duration of the interrogating voltage pulse being insufficient to fully discharge the photons from the base, means for measuring the collector voltage of each phototransistors in synchronism with application of said interrogating voltage pulse to an associated gating means, and means active after all said phototransistors have been interrogated with an interrogating voltage source for causing all said gating means simultaneously to supply to respective collectors a discharging voltage pulse, said discharging voltage pulse having a duration sufficiently longer than said interrogating pulse to discharge substantially completely the photons in said bases.

4,571,499

CIRCUIT ARRANGEMENT FOR SWITCHOVER OF LOAD BETWEEN DIFFERENT SOURCES OF ALTERNATING VOLTAGE

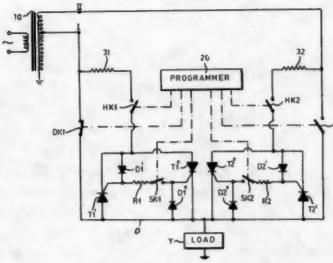
Franz Wein, Beratzhausen, Fed. Rep. of Germany, assignor to Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG, Regensburg, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,848

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304851

Int. Cl.⁴ H02J *3/00*

U.S. Cl. 307—75 **3 Claims**



1. A circuit arrangement for an uninterrupted switchover of a load between two different alternating current supply points at respective voltage levels, comprising:

a first and a second circuit branch having inputs respectively connected to said supply points and having a common output connected to said load;

a first and a second main switch respectively inserted between said common output and the inputs of said first and second branches;

a first and a second collateral network respectively connected across said first and said second main switch, said first network including a first protective resistor, a first ancillary switch and a first pair of antiparallel thyristors in series with one another, said second network including a second protective resistor, a second ancillary switch and a second pair of antiparallel thyristors in series with one another, each thyristor having an anode, a cathode and a gate;

a first disconnect switch inserted between the gates of the thyristors of said first pair;

two first diodes each inserted between the gate and the cathode of one thyristor of said first pair with a polarity corresponding to that of the respectively other thyristor of said first pair for firing the latter thyristor in a closed state of said first disconnect switch upon application of voltage of a corresponding polarity across said first pair of thyristors;

a second disconnect switch inserted between the gates of the thyristors of said second pair;

two second diodes each inserted between the gate and the cathode of one thyristor of said second pair with a polarity corresponding to that of the respectively other thyristor of said second pair of firing the latter thyristor in a closed state of said second disconnect switch upon application of voltage of a corresponding polarity across said second pair of thyristors; and

timing means operable during a switchover from one supply point to the other, with only the main switch of one branch initially closed and all other switches open, to control said switches in a sequence involving closure of the ancillary and disconnect switches of said one branch, opening of the main switch of said one branch, closure of the ancillary and disconnect switches of the other branch, opening of the disconnect and ancillary switches of said one branch, closure of the main switch of said other branch, and opening of the disconnect and ancillary switches of said other branch.

4,571,500

ELECTRIC CIRCUIT FOR CONTROLLING A TRACTOR-PULLED MOUNTED DEVICE ADJUSTABLE IN HEIGHT BY A HYDRAULIC JACK

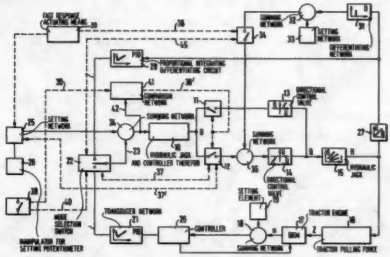
Norbert Mucheyer, Rechtenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,445

Claims priority, application Fed. Rep. of Germany, May 4, 1983, 3316305

Int. Cl.⁴ A01B *63/112*

U.S. Cl. 307—154 **6 Claims**



1. An electric circuit for controlling a tractor-pulled mounted device adjustable in height by a hydraulic jack, comprising a control for activating the lifting and lowering function of the jack, means for applying a differential signal to said control which differential signal is combined of a reference input defining a desired set value and either of a selected position-responsive actual value or a force-responsive actual value,

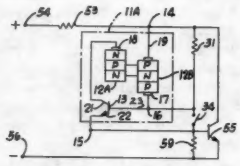
an operator controlled mode select switch for selecting either position or force responsive control characterized in that a differentiating network for producing a signal proportional to the adjusting speed of the jack is connected in series to a transducer for producing the position-responsive actual signal, a summing network producing a limiting signal for the lowering speed in response to said speed-proportional signal and an adjustable maximum signal, said limiting signal being combined with the signal of the controller for controlling the lowering function of the jack, said limiting signal for the lowering speed being activated in response to operating said mode select switch to select the mode of operation either to position control or force control.

4,571,501

ELECTRONIC CONTROL CIRCUIT

Robert J. Crosby, Wickliffe, Ohio, assignor to Acme-Cleveland Corporation, Pepper Pike, Ohio

Filed Oct. 12, 1983, Ser. No. 541,131
Int. Cl.[4] H03K *17/04, 17/10, 17/72, 17/60*
U.S. Cl. 307—252 R **17 Claims**



1. An electronic control circuit comprising in combination:
first and second terminals adapted to be connected respectively to positive and negative DC source terminals;
a control terminal on said control circuit;
an NPN transistor having collector, emitter, and base electrodes;
semiconductor means including at least one structure having a first series of NPN conductivity regions and a second series of PNP conductivity regions;
said P conductivity region of said first series being directly connected to said first-mentioned P conductivity region in said second series and connected to said first terminal;
said second-mentioned N conductivity region in said first series being directly connected to said N conductivity region in said second series;
said first-mentioned N conductivity region in said first series being connected to said collector electrode;
said second-mentioned P conductivity region in said second series being adapted to be connected to said base electrode;
means connecting said emitter electrode to said second terminal; and
means connecting said control terminal to said base electrode to control the current thereinto.

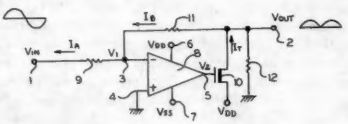
4,571,502

FULL WAVE RECTIFIER HAVING AN OPERATIONAL AMPLIFIER

Tadakatsu Kimura; Takayoshi Makabe, and Yoshiaki Kuraishi, all of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 446,865
Claims priority, application Japan, Dec. 9, 1981, 56-197852
Int. Cl.[4] H03K *5/00;* **H03F** *3/16*
U.S. Cl. 307—262 **5 Claims**

1. A full wave rectifier comprising:
a rectifier input terminal supplied with an AC signal and a rectifier output terminal for delivering a rectified DC signal;
operational amplifier means for amplifying the AC signal, said amplifier having an inverting input terminal, a grounded non-inverting input terminal and an output terminal;
rectifier gain setting means including a first resistor coupled between the inverting input terminal of the amplifier and



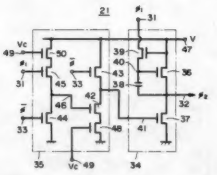
the rectifier input terminal, and a second resistor having a resistance which is the same as the resistance of the first resistor, said second resistor being coupled between the inverting input terminal of the amplifier and the rectifier output terminal; and
depletion type MOS FET means having zero or negative threshold voltages which eliminate forward and reverse voltage, drops coupled to the output terminal of the amplifier for performing a switching operation.

4,571,503

SUPPLY VOLTAGE LEVEL INDEPENDENT CLOCK GENERATOR

Youichi Tobita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,597
Claims priority, application Japan, Jul. 7, 1982, 57-119361
Int. Cl.[4] H03K *5/135, 3/33, 17/284, 17/693*
U.S. Cl. 307—269 **8 Claims**

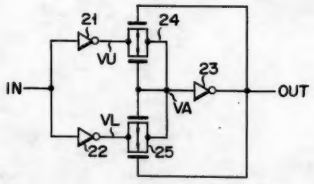


1. A clock generator connected to a power supply and adapted to receive an input signal and provide a clock output signal of a predetermined delay time with respect to the input signal applied thereto, said clock generator comprising:
a delay circuit responsive to said input signal to provide a delay signal of a predetermined delay time;
said delay circuit including at least one constant-resistance transistor supplied at its control electrode with a constant voltage independent of variations in the power supply voltage and exhibiting an ON resistance independent of said power supply voltage, said constant-resistance transistor serving to make the predetermined delay time of said delay signal substantially independent of variations in said power supply voltage, and
a drive circuit operatively connected to said delay circuit to provide said clock output signal.

4,571,504
SCHMITT TRIGGER CIRCUIT WITH SELECTION CIRCUIT

Yoshihiro Iwamoto, Kawasaki, and Tetsuya Iida, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 19, 1983, Ser. No. 543,294
Claims priority, application Japan, Oct. 21, 1982, 57-185110
Int. Cl.[4] H03K 3/295
U.S. Cl. 307—290 11 Claims



1. A Schmitt trigger circuit comprising:

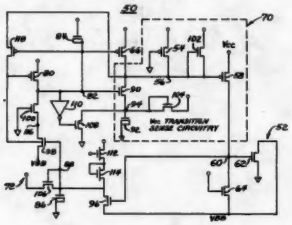
first and second wave-shaping circuits which have different respective threshold voltages and which receive a common input signal and provide different output wave-shapes in accordance with their respective threshold voltages and changes in said input signal; and

a selection circuit which receives outputs from both said first and second wave-shaping circuits and which selects the output of one of said wave-shaping circuits, to provide the Schmitt trigger output signal, in response to the logic level of the output wave-shape of said selected wave-shaping circuit, and, in response to an inversion in logic level of the output wave-shape of the selected wave-shaping circuit, selects the output of the other of said wave-shaping circuits to provide the Schmitt trigger output signal.

4,571,505
METHOD AND APPARATUS OF REDUCING LATCH-UP SUSCEPTIBILITY IN CMOS INTEGRATED CIRCUITS

Sargent S. Eaton, Jr., Colorado Springs, Colo., assignor to Inmos Corporation, Colorado Springs, Colo.

Filed Nov. 16, 1983, Ser. No. 552,249
Int. Cl.[4] H03K 17/693
U.S. Cl. 307—297 20 Claims

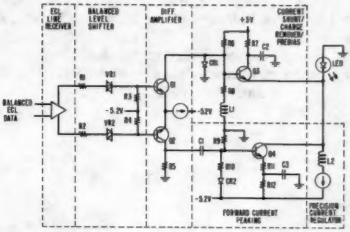


1. A method of using an on chip substrate bias voltage generator to control latch-up in a CMOS circuit on a substrate comprising operating the CMOS circuit, and biasing the substrate during normal circuit operation with said substrate bias voltage generator.

4,571,506
LED DRIVER CIRCUIT

Richard J. Lisco, Whippany, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 28, 1984, Ser. No. 594,219
Int. Cl.[4] H03K 3/01, 3/33
U.S. Cl. 307—311 7 Claims



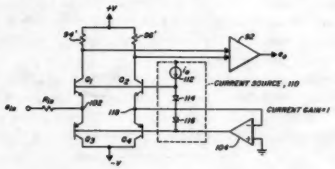
1. A driver circuit for turning an LED on and off in response to input logic one and zero data signals comprising a current regulator series coupled with the LED for maintaining a constant current to the LED, means responsive to an input logic "zero" signal for shunting said current away from the LED and applying for a short time interval a peak reverse bias to the LED, and means responsive to an input logic one signal for removing the current shunt and applying for a short time interval a peak forward current to the LED,

said current shunting means providing a forward prebias potential to the LED at the end of the first recited short time interval.

4,571,507
SUCCESSIVE APPROXIMATION ANALOG-TO-DIGITAL CONVERTER

Jerry M. Collings, Santa Clara, Calif., assignor to Hybrid Systems Corporation, Billerica, Mass.

Filed May 12, 1982, Ser. No. 377,307
Int. Cl.[4] H03K 5/00, 5/153
U.S. Cl. 307—350 3 Claims



1. A zero input impedance current comparator comprising:

a zero impedance current-to-voltage converter and a voltage comparator, said converter including a first pair of transistors having collectors and having interconnected bases, load resistors coupled between the collectors of respective transistors of said first pair of transistors and a positive voltage source, means for providing a voltage to the bases of said first pair of transistors such that the emitter of one of said first pair of transistors is driven to zero responsive to the voltage at the emitter of said one transistor, means adapted to apply an input signal to the emitter of the other of said transistors, and current shunt means coupled between said emitters and a negative voltage source so as to shunt therethrough increased currents responsive to increased currents through said one transistor, said means for providing a voltage to the bases of said first pair of transistors further including means for controlling said

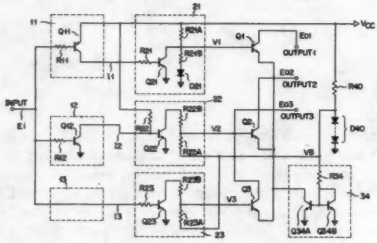
shunt means responsive to said increased currents through said one transistor, said voltage comparator having input terminals coupled to different ones of said collectors of said first pair of transistors.

4,571,508

DIFFERENTIAL SWITCH CIRCUIT

Takashi Koga, and Hideyuki Hagino, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 426,759
Claims priority, application Japan, Oct. 8, 1981, 56-148793
Int. Cl.⁴ H03K *5/153*
U.S. Cl. 307—360 **27 Claims**



1. A differential switch circuit comprising:

input means for receiving three or more distinct levels of an input signal and providing switch instructions respectively corresponding to said distinct levels, said input means including a high level comparator for detecting the highest level of said input signal to provide a high level instruction which is one of said switch instructions, the comparison level of said high level comparator being defined by a power supply potential of the switch circuit, said input means also including a low level comparator for detecting the lowest level of said input signal to provide a low level instruction which is one of said switch instructions, the comparison level of said low level comparator being defined by a circuit ground potential;

bias means, coupled to said input means and being responsive to said switch instructions, for generating three or more bias signals respectively corresponding to said switch instructions; and

differential transistor means, coupled to said bias means and being responsive to said bias signals, for generating three or more outputs according to said bias signals, one of said outputs corresponding to one level of said input signal.

4,571,509

OUTPUT CIRCUIT HAVING DECREASED INTERFERENCE BETWEEN OUTPUT TERMINALS

Youichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

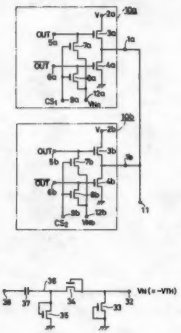
Filed Aug. 24, 1983, Ser. No. 525,901
Claims priority, application Japan, Aug. 24, 1982, 57-148064
Int. Cl.⁴ H03K *19/094*
U.S. Cl. 307—443 **8 Claims**

1. An output circuit responsive to a control signal for selectively providing an output signal at its output terminal in accordance with an input logic signal, said circuit comprising:

a first field effect transistor having first, second, and third terminals and conducting between its first and second terminals in accordance with a potential applied to its third terminal, said third terminal comprising a gate electrode for receiving a voltage corresponding to said input logic signal, said second terminal being coupled to a relatively low voltage point and said first terminal being coupled to an output terminal of said output circuit;

a voltage generating source for providing a potential lower than a potential at said low voltage point; and

a second insulated gate field effect transistor having first, second, and third terminals and conducting between its first and second terminals in accordance with a potential



applied to its third terminal, said third terminal of said second transistor comprising a gate electrode for receiving said control signal, said second terminal of said second transistor being coupled to said voltage generating source and said first terminal of said second transistor being coupled to said gate electrode of said first transistor,

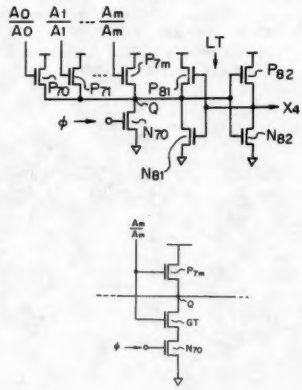
a channel length of said first transistor being shorter than a channel length of said second transistor.

4,571,510

DECODER CIRCUIT

Teruo Seki; Takahiko Yamauchi, both of Kawasaki, and Keizo Aoyama, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1983, Ser. No. 535,831
Claims priority, application Japan, Sep. 29, 1982, 57-168273
Int. Cl.⁴ H03K *19/20, 19/017, 19/096;* **G11C** *8/00*
U.S. Cl. 307—449 **8 Claims**



1. A decoder circuit operatively connected to receive decoder input signals, specifying a selection state or a non-selection state, comprising:

a gate pulse generator for generating a gate pulse having a first polarity and for detecting level changes occurring in any one or more bits of the decoder input signals;

a plurality of input transistors having outputs, respectively, operatively connected to receive corresponding decoder input signals as control input signals, and operatively connected in parallel with each other, said input transistors including first channel type transistors;

a node commonly connected to the outputs of said input transistors;

a gate transistor, operatively connected to said node and operatively connected to receive the gate pulse as a control input, the gate pulse being generated every time a change in said decoder input signals takes place, said gate transistor momentarily inverting a level at said node upon receipt of the gate pulse when said decoder input signals change from those specifying the non-selection state to those specifying the selection state, said gate transistor being a second channel type transistor;

a transistor latch, operatively connected to said node, for maintaining the level at said node and producing a decoder output signal; and

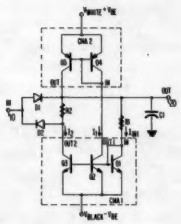
a gate, operatively connected in series with said gate transistor, said gate opening or closing in dependence upon the logic of at least one bit of the decoder input signals.

4,571,511

NOISE REDUCTION SYSTEM

Robert A. Dischert, Burlington County, N.J.; William H. Meise, Bucks County, Pa., and Clement A. Berard, Jr., Hopewell Township, Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 27, 1983, Ser. No. 508,287
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—547 **20 Claims**



1. Apparatus for reducing electrical noise in a signal, comprising:

threshold means having an input terminal for applying said signal and having an output terminal at which portions of signal excursions of said signal in excess of positive and negative threshold values is available;

means coupled to said output terminal for storing said signal portions to develop a noise reduced signal and for causing said positive and negative thresholds to track said passed signal; and

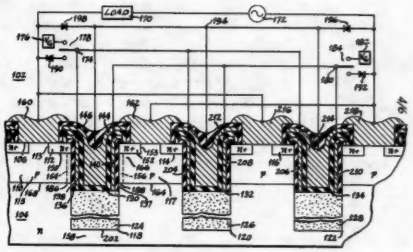
means responsive to said noise reduced signal for varying the values of at least one of said thresholds relative to the signal passed.

4,571,512

LATERAL BIDIRECTIONAL SHIELDED NOTCH FET

Herman P. Schutten, Milwaukee; James A. Benjamin, Waukesha, both of Wis., and Robert W. Lade, Fort Myers, Fla., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,479
Int. Cl.[4] H03K *17/689*
U.S. Cl. 307—577 **11 Claims**



1. A bidirectional FET, comprising in a semiconductor substrate:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

a notch extending between and separating said first and second source regions and said first and second channel regions, and extending into said drift region;

first insulated gate means in said notch proximate said first channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first channel region;

second insulated gate means in said notch proximate said second channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said second channel region;

said single drift region forming first and second PN junctions with respective said first and second channel regions, said first and second source regions forming third and fourth PN junctions with respective said first and second channel regions;

a first main electrode contacting said first source region and said first channel region;

a second main electrode contacting said second source region and said second channel region;

a source of alternating voltage impressed across said first and second main electrodes such that during the first half cycle of said alternating voltage said first PN junction is a forward biased junction and said second PN junction is a reverse biased junction, and such that during the second half cycle of said alternating voltage said second PN junction is a forward biased junction and said first PN junction is a reverse biased junction;

a first gating voltage source connected to said first gate means in said second half cycle of said alternating voltage to create a first inversion channel region between said

single drift region and said first source region to short the otherwise blocking reverse biased said first PN junction during said second half cycle of said alternating voltage such that current flows through said FET from said second main electrode to said first main electrode during said second half cycle of said alternating voltage;

a second gating voltage source connected to said second gate means in said first half cycle of said alternating voltage to create a second inversion channel region between said single drift region and said second source region to short the otherwise blocking reverse biased said second PN junction during said first half cycle of said alternating voltage such that current flows through said FET from said first main electrode to said second main electrode during said first half cycle of said alternating voltage;

said FET having an OFF state in the absence of said gating electrical potential from said first and second gating voltage sources, said single drift region supporting OFF state blocking voltage in both directions, and wherein said first and second gate means are at non-common potentials in said OFF state;

shielding means in said notch insulated between said first and second gate means for preventing electric field gradient induced depletion in said drift region along said notch in said OFF state, to prevent unwanted inducement of conduction channels;

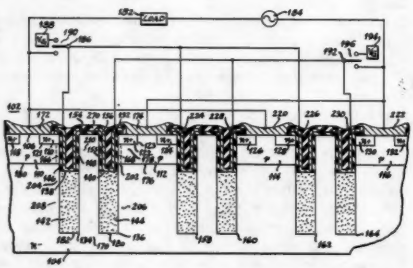
means connecting said shielding means to said main electrodes in said OFF state such that the potential of said shielding means is substantially the same as the potential in said drift region along the edge of said notch below the respective said channel region in said OFF state such that said shielding means shields said last mentioned notch edge drift region portion from electric field gradients from the gate means along the opposite notch edge and prevents attraction of given polarity carriers in said drift region towards the edges of said notch and prevents electric field gradient induced depletion and unwanted inducement of conduction channels in said drift region during said OFF state.

4,571,513

LATERAL BIDIRECTIONAL DUAL NOTCH SHIELDED FET

Robert W. Lade, Fort Myers, Fla.; James A. Benjamin, Waukesha, and Herman P. Schutten, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,478
Int. Cl.[4] H03K *17/687*
U.S. Cl. 307—577 **7 Claims**



1. A bidirectional FET, comprising in a semiconductor substrate:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

first and second spaced notches extending between said first and second source regions and said first and second channel regions;

first insulated gate means in said first notch and including a portion proximate said first channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first channel region;

second insulated gate means in said second notch and including a portion proximate said second channel region and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said second channel region;

said single drift region forming first and second PN junctions with respective said first and second channel regions, said first and second source regions forming third and fourth PN junctions with respective said first and second channel regions;

a first main electrode contacting said first source region and said first channel region;

a second main electrode contacting said second source region and said second channel region;

a source of alternating voltage impressed across said first and second main electrodes such that during the first half cycle of said alternating voltage said first PN junction is a forward biased junction and said second PN junction is a reverse biased junction, and such that during the second half cycle of said alternating voltage said second PN junction is a forward biased junction and said first PN junction is a reverse biased junction;

a first gating voltage source connected to said first gate means in said second half cycle of said alternating voltage to create a first inversion channel region between said single drift region and said first source region to short the otherwise blocking reverse biased said first PN junction during said second half cycle of said alternating voltage such that current flows through said FET from said second main electrode to said first main electrode during said second half cycle of said alternating voltage;

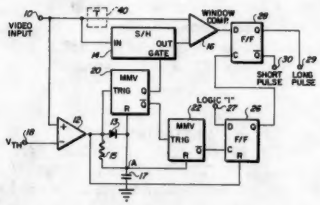
a second gating voltage source connected to said second gate means in said first half cycle of said alternating voltage to create a second inversion channel region between said single drift region and said second source region to short the otherwise blocking reverse biased said second PN junction during said first half cycle of said alternating voltage such that current flows through said FET from said first main electrode to said second main electrode during said first half cycle of said alternating voltage;

said FET having an OFF state in the absence of said gating electrical potential from said first and second gating voltage sources, said single drift region supporting OFF state blocking voltage in both directions, and wherein said first and second gate means are at non-common potentials in said OFF state.

4,571,514
AMPLITUDE ADJUSTED PULSE WIDTH DISCRIMINATOR AND METHOD THEREFOR

Robert N. Nelson, Scottsdale; Keith A. Olds, Mesa, and Scott C. White, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1982, Ser. No. 444,919
Int. Cl.[4] H03K 5/22, 5/26
U.S. Cl. 307—234 9 Claims



1. An amplitude adjusted pulse width discriminator, for application of a received pulse having a leading edge, comprising:

means for providing an input;

means, coupled to said means for providing an input, for establishing a threshold signal indicating that the leading edge of a pulse received at said means for providing an input exceeds a selected threshold;

means, coupled to said means for providing an input, for sampling and holding the pulse received at said means for providing an input to provide a held pulse sample;

gating means for gating said means for sampling and holding, said gating means having an input, a reset, a first output and a second output, said input of said gating means being coupled to an output of said means for establishing a threshold signal and said first output of said gating means being coupled to a gate of said means for sampling and holding;

comparing means for comparing said held pulse sample with said pulse received at said means for providing an input to provide a pulse amplitude window signal, said comparing means having a first input, a second input and an output, said first input of said comparing means being coupled to said means for providing an input and said second input of said comparing means being coupled to an output of said means for sampling and holding;

timing means for timing a desired pulse discrimination interval signal, said timing means having a triggering input, a reset and an output, said triggering input of said timing means being coupled to said second output of said gating means and said reset of said timing means being coupled to said output of said means for establishing a threshold signal;

controlling means for controlling an output of said amplitude adjusted pulse width discriminator, said controlling means having a clock input, a reset and an output, said clock input of said controlling means being coupled to said output of said timing means and said reset of said controlling means being coupled to said output of said means for establishing a threshold signal;

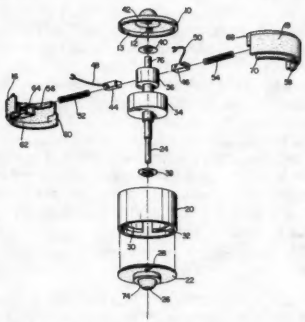
means for providing an output signal indicative of a pulse width discrimination status, said means for providing an output signal having an input, a clock input and an output, said input of said means for providing an output signal being coupled to said output of said comparing means, said clock input of said means for providing an output signal being coupled to said output of said controlling means and said output of said means for providing an output signal being coupled to an output of said amplitude adjusted pulse width discriminator; and

means for clearing said gating means and said timing means, said means for clearing being coupled to said reset of said gating means and to said reset of said timing means.

4,571,515
SMALL MOTOR ASSEMBLY

Edward J. Baader, 232 Stephen La., Springfield, Ohio 45505

Filed Sep. 26, 1984, Ser. No. 654,493
Int. Cl.[4] H02K 15/00
U.S. Cl. 310—42 5 Claims



1. In a dynamoelectric motor a brush holder and brush assembly comprising:

a. A magnet ring housing adapted for supporting curvate magnet elements;

b. a pair of semi-circular motor casing sides snap-fitted together, so as to extend axially from an end of said magnet ring housing, each motor casing side, further including:

i. top and bottom axially extending flanges;

ii. laterally extending tapered end tabs, the opposed end tabs on each motor casing side being complementally engageable with each other; and

iii. a radially extending brush housing having an open radially extending slot in its side supporting a compression spring and brush assembly in contact with the commutator;

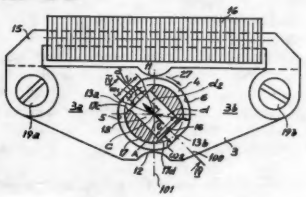
c. a motor casing top cap and a motor casing bottom cap both made of electrical insulating material and engaging, respectively, said pair of semi-circular motor casing sides and said magnet ring housing; and

d. a shaft extending from said motor casing top cap through said motor casing bottom cap, said shaft rotatably supporting a commutator in contact with said brushes; and an armature assembly contacting said curvate magnetic elements.

4,571,516
ELECTROMAGNETIC MOTOR

Ali Schneiter, Neuchatel, Switzerland, assignor to Ebauches, S.A., Switzerland

Filed Jan. 29, 1981, Ser. No. 229,727
Claims priority, application Switzerland, Feb. 6, 1980, 936/80; Nov. 5, 1980, 8205/80
Int. Cl.[4] H02K 37/00
U.S. Cl. 310—49 R 8 Claims



1. An electromagnetic motor comprising, in combination:

a rotor mounted for rotation around a rotation axis and including a bar magnet having two poles of opposite polarity defining a magnetization axis substantially perpendicular to said rotation axis and two end faces, each of said faces being substantially flat and perpendicular to said magnetization axis; and

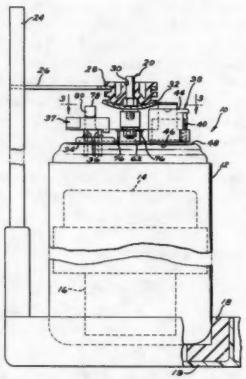
a one piece stator including two pole pieces having each a first and a second end, an element of high magnetic permeability interconnecting said first ends, and a coil disposed around said element, said second ends of said pole pieces being disposed in a facing relationship and interconnected by two zones of high magnetic reluctance for defining an opening having a wall surface surrounding said rotor, said wall surface comprising a first part disposed at a substantially constant first distance from said rotation axis and a second part disposed at least a second distance, different from said first distance, from said rotation axis for producing on said rotor a positioning torque, said positioning torque being a substantially linear function of the angular position of the rotor at least between a first and a second angular position of said rotor.

4,571,517

HERMETIC COMPRESSOR INCLUDING A TERMINAL BLOCK AND THERMAL PROTECTION RETAINER MEANS

Gary L. Chastine, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1984, Ser. No. 660,647
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 C **7 Claims**



1. A hermetic compressor including a casing having a side wall, a lower wall, and an upper wall provided with an opening and a vertically extending stud member secured to said upper wall;

an electric terminal disposed in said opening;

conductor pins arranged in said terminal including end portions projecting outwardly from said casing;

a terminal receptacle block assembly having female terminals arranged to receive said end portion of said conductor pins;

a thermal overload protector including a base wall dimensioned to conform to said casing upper wall and an upper wall having a central depression;

a retainer arrangement removably securing said terminal receptacle relative to said electric terminal and said thermal overload protector relative to said casing upper wall comprising:

a resilient retainer means formed of stiffly flexible metal stock including an opening receiving said stud member, a first leg portion extending outwardly from a central opening including an arcuate member engaging the side walls of said thermal overload protector and a retainer member engaging said upper wall of said thermal overload, a second leg portion extending outwardly from said central opening including retaining means engaging the upper end of said terminal receptacle block;

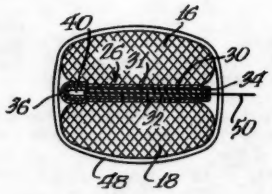
a post member threadably engaging said stud member including an enlargement dimensioned for applying pressure on said retainer means to cause said retaining member and said retaining means of said leg portions to forceably engage said terminal block and said thermal overload protector to removably secure said terminal receptacle block assembly relative to said conductor pins and removably securing said thermal overload relative to said compressor upper wall.

4,571,518

TEMPERATURE SENSOR POCKET FOR DYNAMOELECTRIC MACHINE WINDING

Lawrence J. Kintz, Jr., and Edward S. Blain, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 12, 1984, Ser. No. 682,270
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 R **10 Claims**



1. A protector for use in electric machines comprising:

an elongated, substantilly sealed envelope formed of two thin plies of electrically insulating material sandwiching a thin ply of thermally conductive metal bonded to said insulating pliesand stopping short of the edges of said insulating plies, the edges of said insulating plies being adhered to each other to define said envelope;

a small opening to said envelope between the edges of said outer ply;

a sensor within said envelope in heat transfer relation with said metal ply and having electrical leads extending out of said envelope through said opening; and

at least two sets of electrical windings sandwiching said envelope.

4,571,519

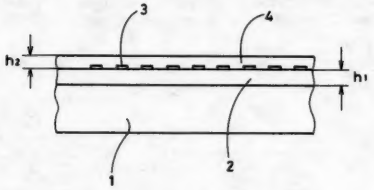
SEZAWA SURFACE ACOUSTIC WAVE DEVICE USING A PIEZOELECTRIC LAYER OVER A NITRIDE LAYER ON A SUBSTRATE

Akira Kawabata, Uji; Tadashi Shiosaki, Kyoto; Fumio Takeda, Toyama; Satoru Fujishima, Muko, and Hideharu Ieki, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Nov. 30, 1984, Ser. No. 676,584
Claims priority, application Japan, Nov. 30, 1983, 58-227753
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 A **5 Claims**

1. A surface acoustic wave device comprising a surface acoustic wave substrate member composed by forming a nitride film and a piezoelectric thin film successively on a dielectric substrate, with thickness h_1 of said nitride film and thickness h_2 of said piezoelectric thin film being set within ranges of $0.1 \leqq h_1/\lambda \leqq 10$ and $0.05 \leqq h_2/\lambda \leqq 0.3$ respectively, thereby to utilize Sezawa wave or a similar mode wave transmitted on

said surface acoustic wave substrate member in multi-layer structure,



wherein λ is representative of wavelength of said Sezawa wave.

4,571,520

ULTRASONIC PROBE HAVING A BACKING MEMBER OF MICROBALLOONS IN URETHANE RUBBER OR THERMOSETTING RESIN

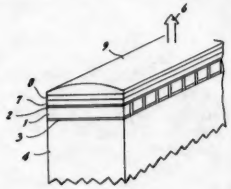
Koetsu Saito, Sagamihara; Masami Kawabuchi, Yokohama; Keisaku Yamaguchi, Isehara, and Keiji Iijima, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jun. 7, 1984, Ser. No. 618,369

Claims priority, application Japan, Jun. 7, 1983, 58-102024; Jun. 7, 1983, 58-102026; Apr. 2, 1984, 59-65363

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—327 **14 Claims**



1. An ultrasonic probe comprising:
an array of piezoelectric transducer elements; and
a backing member provided on one surface of said array, said backing member being composed of a mixture of urethane rubber and microballoons.

4,571,521

COLOR CRT WITH ARC SUPPRESSION STRUCTURE

Anthony V. Gallaro, Auburn, and Mark A. Josephs, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Aug. 23, 1983, Ser. No. 525,758

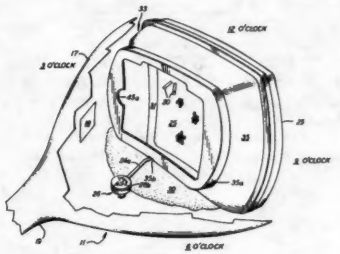
Int. Cl.⁴ H01J *29/80*

U.S. Cl. 313—402 **6 Claims**

1. A color cathode ray tube comprising a glass envelope of integrated neck, funnel and face panel portions, a plural beam electron gun in the neck portion, a phosphor screen having a plurality of phosphor elements on the interior surface of the face panel portion, an aperture mask adjacent the screen for directing the electron beams to the desired phosphor elements, a phosphor pattern on the gun side of the mask, an internal magnetic shield attached to the aperture mask for shielding the beams from external stray magnetic fields, the shield comprising a sidewall enclosure having a contoured portion and a flat portion, the shield also comprising a ledge extending inward from the flat portion of the sidewall enclosure, a conductive coating on the interior surface of the glass envelope to provide electrical connection between the terminal portion of the gun and the mask, an electrically conductive window in the conductive coating on one side of the funnel to allow external detection of emissions from the mask phosphor, and a getter assembly for flashing a getter deposit inside the tube, characterized in that:

(a) the conductive coating comprises a first coating substantially in the forward portion of the funnel and a second arc suppression coating in contact with the first coating and extending substantially into the neck region of the tube, and

(b) the getter assembly comprises a getter container and wand, the wand having two flat sections and a central



section, one flat section attached to the flat portion of the shield sidewall enclosure, and the other flat section attached to said getter container, said getter container in contact with the first conductive coating on a side of the funnel other than the window side, said getter container defining an aperture elongated in a direction substantially normal to the length dimension of the wand, said aperture facing the forward portion of the funnel, whereby upon getter flash, the getter deposit is distributed substantially along the forward portion of the side of the funnel and the facing side of the magnetic shield away from the window side.

4,571,522

METHOD OF MANUFACTURING A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP, A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP MANUFACTURED BY MEANS OF THIS METHOD, AND A DEVICE FOR CARRYING OUT THIS METHOD

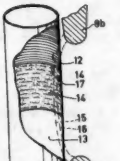
Jan de Vries, Roosendaal, and Jacob W. de Ruiter, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 7, 1984, Ser. No. 607,910

Claims priority, application Netherlands, May 20, 1983, 8301797

Int. Cl.⁴ H01J *1/62, 63/04;* **B05D** *3/02, 5/06*

U.S. Cl. 313—485 **5 Claims**



1. In a method of manufacturing a low-pressure mercury vapour discharge tube comprising a discharge tube, by applying to the inner wall surface of said tube a suspension of a luminescent material in a manner such that a layer of said suspension adheres to said wall surface and that any non-adher-

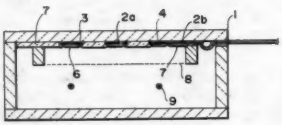
ing portion of the suspension is removed from said wall surface and drying said suspension layer adhering to said wall surface, the improvement comprising arranging said tube in a non-horizontal position and drying the suspension layer adhering to said wall surface while said tube is arranged in said non-horizontal position by heating a zone of said suspension layer extending along the circumference of said tube by means of a high frequency electrical field, said field being positioned so relative to said tube such that said zone is displaced towards the lower end of said tube from a starting zone near the upper end of said tube.

5. A low-pressure mercury vapour discharge lamp manufactured by means of a method claimed in claim 1.

4,571,523
FLUORESCENT DISPLAY DEVICE

Kiyoshi Morimoto, and Hiroshi Watanabe, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 28, 1983, Ser. No. 536,645
Claims priority, application Japan, Oct. 23, 1982, 57-185384
Int. Cl.⁴ H01J *63/06, 19/40*
U.S. Cl. 313—497 **7 Claims**



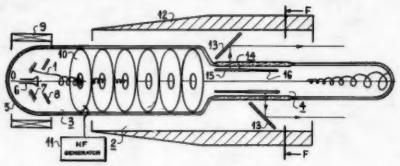
1. A fluorescent display device comprising:
a transparent insulating substrate;
transparent anode conductors having micro-gaps formed therein arranged on a first surface of said substrate according to a desired display pattern;
a filamentary cathode positioned apart from said transparent anode conductor for supplying electrons;
a metallic film deposited on said one surface of said substrate, said metallic film including wiring means and frames for defining display segment openings each having said anode conductor contained therein; and
a phosphor layer deposited to cover at least said transparent anode conductors contained within and a portion of said frames, and which is adapted to emit light when electrons from said filamentary cathode impinge thereon with the light emission from said phosphor layer being observed from the second surface side of said transparent insulating substrate through said transparent anode conductor and to provide a uniform light emission through said display segment openings.

4,571,524
ELECTRON ACCELERATOR AND A MILLIMETER-WAVE AND SUBMILLIMETER-WAVE GENERATOR EQUIPPED WITH SAID ACCELERATOR

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 304,826, Sep. 23, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,818
Claims priority, application France, Sep. 26, 1980, 80 20714
Int. Cl.⁴ H01J *25/00*
U.S. Cl. 315—4 **8 Claims**

1. An electron beam device comprising an evacuated enclosure housing an electron gun for providing an annular electron beam which travels along a beam axis O_z with a non-zero component of angular velocity, means downstream along the beam axis for accelerating the angular velocity of the beam, and resonator means along the beam axis downstream of the accelerating means for utilizing the accelerated beam characterized in that the accelerating means comprises a delay line which is to be supplied with high frequency electromagnetic energy for establishing along the beam axis an electromagnetic field whose electric field component is primarily longitudinal in the direction of the beam axis and means for establishing a magnetostatic field which is coextensive with the delay line

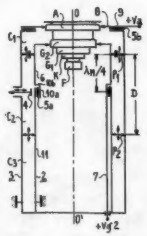


and whose strength along the delay line increases with increasing distance, whereby the interaction of said longitudinal electric field component and said electron beam compensates for an increasing magnetostatic field results in an increase in the angular velocity of the beam.

4,571,525
RESONANT COAXIAL CAVITIES FOR A GRID VACUUM TUBE

Pierre Gerlach, and Claude Grolleau, both of Thonon les Bains, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 16, 1983, Ser. No. 562,444
Claims priority, application France, Dec. 23, 1982, 82 21621
Int. Cl.⁴ H01J *7/46, 19/80*
U.S. Cl. 315—39 **8 Claims**



1. Resonant cavities for a grid vacuum tube, comprising a coaxial line divided into a plurality of resonant cavities (C1, C2, C3) by at least two pistons (P_1, P_2) adjustable in position along the coaxial line, said line having an inside cylinder (2) placed coaxially inside an outside cylinder (3), both cylinders being grounded; capacitive decoupling (5*a*, 5*b*) between the cylinders (2, 3) and two respectively associated electrodes (G_2, A) of the vacuum tube; the decoupling (5*a*) between the inside cylinder (2) and said associated electrode (G2) being positioned at a distance from said associate electrode (G_2) approximately equal to $\frac{1}{4}$ wave length of the highest operating frequency of the cavities; and said decoupling (5*a*) dividing said inside cylinder (2) into two parts (6 and 11) one (6) connected to said associated electrode (G_2), and the other (11) connected to the ground, said decoupling (5*a*) insulating said one part (6) from the other (11).

4,571,526
LOW-PRESSURE DISCHARGE LAMP WITH COOLED INTERNAL BALLAST

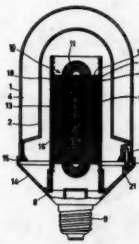
Gustaaf A. Wesselink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 698,277, Feb. 5, 1985, abandoned, which is a continuation of Ser. No. 548,054, Nov. 17, 1983, abandoned, which is a continuation of Ser. No. 294,868, Aug. 21, 1981, Pat. No. 4,455,508. This application Jul. 22, 1985, Ser. No. 757,760

Claims priority, application Netherlands, Sep. 11, 1980, 8005112

Int. Cl.⁴ H01J *25/50*

U.S. Cl. 315—56 **4 Claims**



1. A low-pressure metal-vapor discharge lamp having an outside wall surface, comprising:

a discharge vessel having a geometric axis, and being closed in a vacuum-tight manner;

a quantity of rare gas and vaporizable metal contained in said vessel;

electrodes disposed in said discharge vessel, said vessel and electrodes being arranged and dimensioned such that during operation of the lamp a discharge is present along a discharge path between said electrodes, said discharge path being curved in one or more places; and

a stabilization ballast having an outer surface, said discharge vessel being disposed around at least a major part of said ballast outer surface;

characterized by comprising an elongated thin-walled member having an axis, made of a heat-conductive metal material disposed in heat-conducting relation with a major portion of the outer surface of said ballast, substantially all of said thin-walled member being intermediate said ballast and said discharge vessel;

an electrically insulating layer disposed between the wall of said thin-walled member and said ballast; and

a heat-conductive metal collar extending from said thin-walled member to the outside wall surface of said lamp, said collar being in thermal contact with an axial portion of said thin-walled member,

wherein during operation heat generated by the ballast is dissipated via said thin-walled member and collar to said lamp outer surface.

4,571,527
VFET DRIVING CIRCUITS FOR PLASMA PANEL DISPLAY SYSTEMS

William J. Martin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 431,864, Sep. 30, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 675,259

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—169.4 **6 Claims**

1. A system for suppying a sustain voltage to a display device having a plurality of discharge cells comprising, in combination:

a first switch circuit including a first FET having a drain connected to a high voltage, a source connectable to an output connection to said display device, and having a gate;

a second switch circuit including a second FET having a drain connected to the source of said first FET through a first junction and a source connected to ground potential, and having a gate;

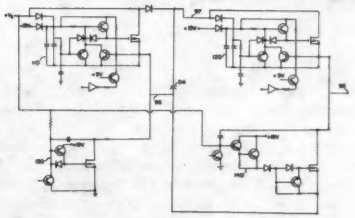
a third switch including a third FET having a gate and having its source connected to said output connection and its drain connectable to said high voltage through a second junction;

a fourth switch including a fourth FET having a gate and having its drain connected to said output connection and its source connected to said first junction;

a diode having its anode connected to said high voltage and its cathode connected to said second junction which connects to the drain of said third FET;

a capacitor connected between said first and second junctions;

a control means connected to said FET gates for operating said switches to place the system in one of multiple states;



a first state having the 2nd and 4th FETs conducting and the 1st and 3rd FETs non-conducting to complete a charging connection to said capacitor from the high voltage to ground to charge said capacitor to the level of said high voltage and also providing a ground voltage level at said output connection;

a second state having the 2nd and 3rd FETs non-conducting and the 1st and 4th FETs conducting to complete a circuit from said high voltage to said output connection through said 1st and 4th switches to provide said high voltage at said output connection;

a third state having said 1st and 3rd FETs conducting and said 2nd and 4th FETs non-conducting to complete a circuit to place the high voltage in series with said capacitor which has been charged to said high voltage level by said 1st state wherein a signal of twice the amplitude of said high voltage level is provided at said output connection.

4,571,528
ELECTROMAGNETIC ROTARY MOTOR

Daniel W. McGee, Batavia, Iowa; Stephan Rosinski, Boothwyn, Pa., and Claude S. Setzer, Fairfield, Iowa, assignors to Magna Motive Industries, Inc., Fairfield, Iowa

Continuation of Ser. No. 506,439, Jun. 21, 1983, abandoned. This application Jan. 4, 1985, Ser. No. 689,021

Int. Cl.⁴ H02K *29/00*

U.S. Cl. 318—138 **28 Claims**

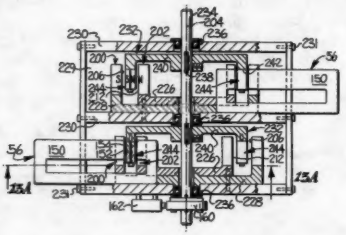
1. An electromagnetic rotary motor comprising:

(a) stator means including stator magnet means having opposing pole faces defining a gap therebetween with a generally uniform magnetic flux density thereacross, said gap having an entrance section, an exit section and a generally curved longitudinal path extending from said entrance section to said exit section around a transverse axis, the magnetic flux density changing from said entrance section to said exit section as a function of arc degree position around said transverse axis;

(b) rotor means mounted for rotation around an axis gener-

ally coincident with said transverse axis, said rotor including a predetermined number of rotor magnets disposed radially outwardly from said transverse axis and substantially within said gap, each pole of each rotor magnet being spaced from said stator pole face and aligned in a predetermined orientation with respect thereto, the magnetic field of each of said rotor magnets interacting with the magnetic field of said stator magnet means; and

(c) electronic control means for inducing an electromagnetic field from an external source of energy, said means for



inducing an electromagnetic field being responsive to the relative rotational position of said rotor for successively interacting with the magnetic field of each of said rotor magnets to urge each of said rotor magnets towards the entrance section of the gap, whereby the magnetic field of each rotor magnet interacts with the magnetic field of said stator means and said means for inducing an electromagnetic field creating forces that urge said rotor magnets along the longitudinal path of said stator gap, causing the rotor to rotate around said transverse axis.

4,571,529

ACTUAL SPEED VALUE CONVERTER FOR THE SPEED CONTROL IN A MOTOR DRIVE SYSTEM

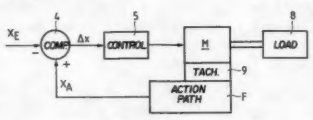
Willi Studer, Nassenwil, and Arturo E. Stosberg, Otelfingen, both of Switzerland, assignors to Willi Studer, AG, Switzerland

Filed Nov. 21, 1983, Ser. No. 553,777

Claims priority, application Switzerland, Dec. 2, 1982, 7022/82

Int. Cl.[4] H02P *1/00*; G11B *21/02*

U.S. Cl. 318—327 **17 Claims**



1. Speed control apparatus for a motor, the combination comprising:

a motor,

a tachometer coupled to said motor to generate a signal representative of the speed of said motor;

an action path for receiving said motor speed signal from said tachometer;

said action path comprising frequency generator means and frequency discriminator means connected downstream of said frequency generator means;

said frequency generator means producing a signal having a frequency higher than the frequency of said tachometer signal;

means to deliver said frequency generator signal to said frequency discriminator means;

said frequency discriminator means being adapted for demodulation of a signal having a given carrier frequency;

a resonant circuit interposed between said tachometer and said action path;

said resonant circuit comprising an inductive means and a capacitive means;

said resonant circuit capacitive means comprising a physical part of said tachometer;

comparator means;

means to connect the output of said frequency discriminator means to said comparator means;

means to supply a speed reference signal to said comparator means; and

means to use the output of said comparator means to control the speed of said motor.

4,571,530

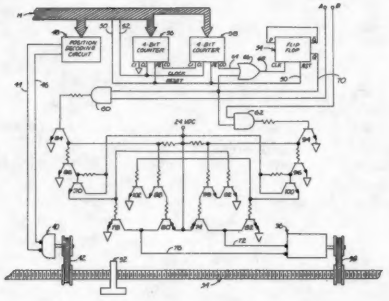
ADAPTIVE PULSING MOTOR CONTROL FOR POSITIONING SYSTEM

James S. Sweeney, Jr., Laguna Beach, Calif., assignor to Unisen, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 289,922, Aug. 4, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 576,013

Int. Cl.[4] G05B *11/18*

U.S. Cl. 318—594 **45 Claims**



1. A destination-finding control system for a direct current motor which moves a driven element, comprising:

means for establishing a destination for the driven element;

means for controlling the approach of the driven element to the destination including:

(a) means for providing a series of timed, alternating motor-available and motor-unavailable periods which alternate continuously until the destination is reached, the motor being capable of receiving driving energy only during the motor-available periods; and

(b) means for varying the amount of driving energy received by the motor during separate motor-available periods, while maintaining the same interval between the starting times of successive motor-available periods.

4,571,531

AUTOMATIC PROTECTIVE CIRCUIT SYSTEM FOR EMERGENCY LIGHTS

Ming-Hsin Lin, 4, Lane 110, Hsiu-Nan Rd., Pei-teng District, Taichung, Taiwan

Filed Apr. 11, 1984, Ser. No. 598,988

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—2 **7 Claims**

1. An automatic protective circuit system for emergency lights of the type having a casing body, a left light and a right light separately provided on the top of the casing body, and a storage battery installed therein comprising:

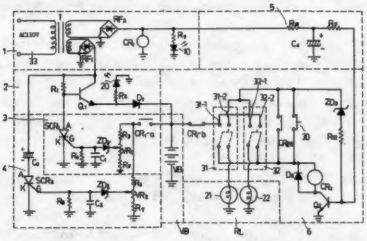
a power supply means for being connected to the external power source;

a charging means connected to said power supply means for effecting charging operations;

an upper-limit charging control means coupled with said charging means for automatically stopping the charging operation thereof;

a lower-limit charging control means coupled with said charging means for automatically starting the charging operation thereof;

a lower-limit discharging control means for maintaining a selected power level in the storage battery, a normally-



closed contact and a normally-open contact connecting said means with the battery and connecting said means with the lights;

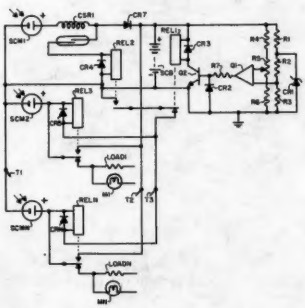
a discharge actuating means for causing said battery to discharge on failure of said power supply means, said means being connected between said power supply means and said lower-limit discharging control means; whereby, the storage battery of the emergency light can be effectively protected from being overcharged and overdischarged.

4,571,532

PHOTOVOLTAIC POWER REGULATION SYSTEM

Dale R. Jaster, Northlake, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Nov. 3, 1983, Ser. No. 548,540
Int. Cl.[4] H02J *7/10*
U.S. Cl. 320—2 **7 Claims**



1. A multi-solar module direct current battery charging arrangement comprising:

a first plurality of solar cells;

a reverse current blocking diode;

a first relay having an energizing winding; and a set of make contacts;

said diode, said energizing winding and said solar module connected across said battery;

a second relay having a second set of make contacts;

said first relay make contacts operated upon a predetermined current flow through said first relay winding to close said first relay make contacts to operate said second relay;

a voltage regulator having a set of make contacts;

said regulator contacts operated upon said battery reaching a predetermined state of charge as indicated by the voltage level;

a second plurality of solar cells and a third relay having a set of make contacts;

said second relay make contacts, said voltage regulator make contacts, said third relay and said second plurality of solar cells connected in series;

said third relay operated upon said second relay operating indicating said solar cells are functioning, and said voltage regulator operating its associated contacts indicating said batteries require further charging to operate said third relay; and

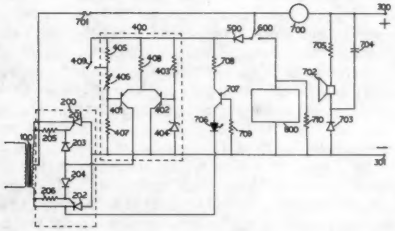
said third relay operated to close said associated contacts to connect said second plurality of solar cells across said battery.

4,571,533

STORAGE BATTERY CHARGING AND MONITORING APPARATUS

Ranjit Dey, 2465 Dunwin Dr., Unit 11, Mississauga, Ontario, Canada (L5L 1T1)

Filed Jan. 21, 1983, Ser. No. 459,888
Int. Cl.[4] H02J *7/10*
U.S. Cl. 320—25 **4 Claims**



1. A battery charging apparatus having a first output terminal and a second output terminal, for charging a storage battery having a positive electrode operatively connected to said first output terminal and a negative electrode operatively connected to said second output terminal, comprising

a stepdown transformer means operative to provide an alternating current of a selected level, said stepdown transformer means having a secondary winding with a centre tap connected to said first output terminal,

silicon controlled rectifier means coupled to said transformer means having an output terminal connected to said second output terminal, said rectifier means being operative selectively to provide and to terminate a direct current for charging said storage battery, control means comprising two transistor means each having base, emitter and controller electrodes wherein the emitter electrodes are commonly connected to said first output terminal, one transistor means having resistor means connected to the base electrode therein and responsive to current flowing through said resistor means to establish a reference voltage, the second transistor means having adjustable resistor means connected to the base electrode therein, said adjustable resistor means being operative to establish a selected charging voltage level, said second transistor means being responsive to comparison of said selected charging voltage level to said reference voltage to selectively activate and deactive said silicon controlled rectifier means for charging said storage battery with said direct current.

a diode means having a cathode terminal and an anode terminal, a resistor means connected to said cathode terminal of said diode means and said commonly connected emitter electrodes of said two transistor means, and said anode terminal of said diode means being connected to

said first output terminal, a second resistor means connected in series to said adjustable resistor means, a switch connected in parallel to said second resistor means and operative to short circuit said second resistor means to provide a second selected voltage level for charging said storage battery,

a second diode means and a third diode means each having a cathode terminal and an anode terminal, the anode terminals of said second diode means and third diode means being commonly connected together,

said silicon controlled rectifier means having a first silicon controlled rectifier and a second silicon controlled rectifier both having an anode terminal connected commonly to said second output terminal, said first silicon controlled rectifier having a cathode terminal connected to one terminal of said secondary winding of said transformer means and a gating terminal connected to said cathode terminal of said second diode means, said second silicon controlled rectifier having a cathode terminal connected to a second terminal of said secondary winding of said transformer means, and a gating terminal connected to said cathode terminal of said third diode means, a first resistive means connected between said gating terminal of said first silicon controlled rectifier and said first terminal of said transformer means,

a second resistive means connected between said gating terminal of said second silicon controlled rectifier and said second terminal of said transformer means, a light emitting means having a cathode terminal connected to said cathode terminal of said second silicon controlled rectifier,

a third transistor means having a collector electrode, emitter electrode and a base electrode, said anode terminal of said light emitting means being connected to said collector electrode of said third transistor means, a second resistive means having one terminal connected to said emitter electrode of said third transistor means and a second terminal connected to said second output terminal, a third resistive means having one terminal connected to said base electrode of said third transistor means and a second terminal connected to said second output terminal.

4,571,534

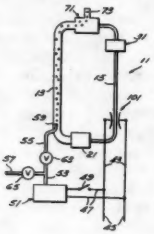
ENERGY CONVERSION SYSTEM WITH FERMENTATION

John H. Cover, 24742 Via San Fernando, Mission Viejo, Calif. 92691

Continuation-in-part of Ser. No. 457,627, Jan. 13, 1983, which is a continuation-in-part of Ser. No. 342,391, Jan. 25, 1982. This application Oct. 14, 1983, Ser. No. 542,062

Int. Cl.[4] G21D *7/02*; H02K *44/00*

U.S. Cl. 322—2 R **29 Claims**



1. An apparatus for converting thermal energy into an alternate form of energy, comprising:

(1) a fluid loop through which flows a liquid, said loop comprising:

(a) at least one flow increase column having fluid entry and fluid exit ends;

(b) a fluid return column having a fluid entry and a fluid exit end;

(c) interconnection means between the fluid exit end of said flow increase columns and the fluid entry end of said fluid return column; and

(d) interconnection means between the fluid entry ends of said flow increase columns and the fluid exit end of said fluid return column;

(2) means for producing carbon dioxide gas from fermentation.

(3) means for causing said liquid to flow through said loop by introducing a portion of said carbon dioxide gas into one of said flow increase columns;

(4) electrical generator means for generating electrical energy from said flowing liquid, the amount of electrical energy generated being proportional to the velocity of the flow of said liquid; and

(5) means for supplementing said flow to increase the electrical energy generated by said electrical generator means comprising:

(a) an electrolytic gas generator coupled to said electrical generator means for using at least a portion of said electrical energy to electrolyze a second liquid to form a gas, said gas containing chemical energy; and

(b) means for introducing a portion of said gas into one of said flow increase columns so that expansion of said electrolyzed gas causes said flow to increase.

4,571,535

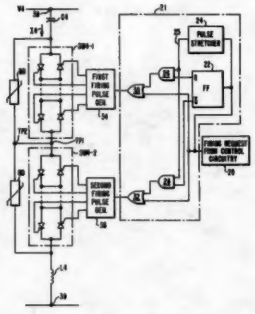
VAR GENERATOR HAVING CONTROLLED DISCHARGE OF THYRISTOR SWITCHED CAPACITORS

Laszlo Gyugyi, Penn Hills Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 15, 1984, Ser. No. 671,844

Int. Cl.[4] G05F *1/70*; H02H *7/09*

U.S. Cl. 323—211 **14 Claims**



1. A VAR generator of the type which supplies reactive power to an AC electrical system for regulation thereof, comprising:

capacitive reactive means interconnectable with the electrical system for supplying the reactive power thereto during a controllable interval of time;

at least two controllable thyristor switch means interconnected in series circuit relationship with said capacitive reactive means in reactive circuit relationship with the electrical system during said interval of time;

non-linear clamping means for limiting overvoltage in the VAR generator connected in parallel with each of the switch means, each clamping means having a predetermined breakover voltage at and above which current conduction may occur with the total breakover voltage being approximately equal to the sum of the breakover voltages of each of the clamping means;

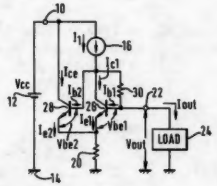
control means interconnected with each of the switch means

for selectively keeping at least one but not all of the switch means in an ON state while turning the remaining switch means to the OFF state during a period of time subsequent to the initiation of said OFF state so that the clamping means in parallel with the switch means that are in the OFF state conducts the capacitive reactive discharge current therethrough as long as the voltage condition exceeds the breakover voltage thereof with the switch means that are in the ON state shunting the discharge current around the clamping means connected in parallel therewith thereby limiting the voltage across the capacitive reactive means to a value approximately equal to that of the sum of the breakover voltages of the conducting clamping means.

4,571,536
SEMICONDUCTOR VOLTAGE SUPPLY CIRCUIT HAVING CONSTANT OUTPUT VOLTAGE CHARACTERISTIC

Hisao Kuwahara, Kamakura, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 23, 1983, Ser. No. 525,706
Claims priority, application Japan, Aug. 23, 1982, 57-145737
Int. Cl.⁴ H03F *1/30*
U.S. Cl. 323—311 **2 Claims**



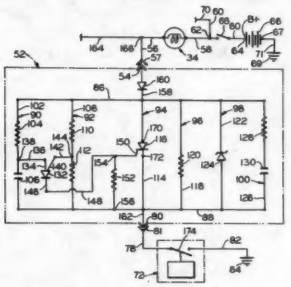
1. A constant output voltage supply circuit comprising:
a DC power source operable to supply DC power between a supply terminal and a reference potential terminal;
a DC current source;
a first transistor having a collector, an emitter and a base and connected at its collector to said supply terminal via said DC current source;
a first resistor connected between the emitter of said first transistor and the reference potential terminal;
a second transistor having a collector, an emitter and a base, the collector of said second transistor being connected to the supply terminal, the emitter of said second transistor being connected to the emitter of said first transistor, and the base of said second transistor being connected to the collector of said first transistor;
a second resistor connected between the collector and base of said first transistor; and
an output terminal connected to the base of said first transistor whereby the current flowing through the first transistor compensates for variances in the current flowing through the second transistor to maintain the current flow through the first resistor constant to provide a constant output voltage characteristic.

4,571,537
CONDITION MONITORING MEANS

Robert E. Taylor, Cadillac, Mich., assignor to Nartron Corporation, Reed City, Mich.

Continuation of Ser. No. 394,496, Jul. 2, 1982, abandoned. This application Apr. 18, 1985, Ser. No. 724,815
Int. Cl.⁴ H02J *3/12*
U.S. Cl. 323—326 **7 Claims**

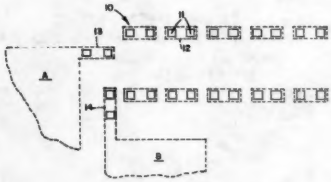
3. The combination of apparatus subject to varying operating conditions, sensory warning means, and circuit means for sensing when a preselected operating condition is experienced by said apparatus and in turn causing said sensory warning means to become effective for creating a sensory warning, said circuit means comprising a power circuit portion and a timing circuit portion, said timing circuit portion being activated upon the occurrence of said preselected operating condition, said timing circuit portion being effective upon the expiration of a span of time subsequent to said timing circuit portion being activated to cause said power circuit portion to be electrically closed, and said power circuit portion upon being electrically closed being effective to cause said sensory warning means to become effective for creating said sensory warning, wherein said apparatus subject to varying operating conditions comprises vacuum actuated motor means for assisting in the actuation of a vehicular brake system, wherein said preselected operating condition comprises the occurrence of a preselected minimum magnitude of vacuum in said vacuum actuated motor means, and wherein said sensory warning means when effective to create said sensory warning is effective for warning the operator of said vehicular brake system, said sensory warning means being effective upon the occurrence of said preselected operating condition to create said sensory warning regardless of whether or not said vehicular brake system is undergoing actuation.



4,571,538
MASK ALIGNMENT MEASUREMENT STRUCTURE FOR SEMICONDUCTOR FABRICATION

Pei-Ming D. Chow, Redondo Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 25, 1983, Ser. No. 488,225
Int. Cl.⁴ H01L *21/66*; G01R *27/02*
U.S. Cl. 324—65 R **9 Claims**



1. A method of quantitatively measuring the relative alignment of elements on a surface of a semiconductor body formed by two sequential masking steps during processing thereof comprising the steps of:
providing a fixed pattern of contact images on a first mask;
providing a fixed pattern of repeating U-shaped images on a second mask;
processing said semiconductor body in a predetermined manner so that the contact images on said first mask align with the U-shaped images on said second mask so that respective ones of the contact images interconnect two respective

adjacent U-shaped images, thereby forming a boustrophederal pattern;

applying an electrical probe to opposed ends of said boustrophederal pattern; and

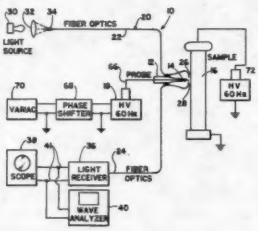
measuring the electrical resistance between the ends of said boustrophederal pattern to determine a parameter related to the relative alignment of elements on said semiconductor body.

4,571,539

HIGH VOLTAGE FIELD MAPPING APPARATUS AND METHOD

Alonso Rodriguez-Pena, Morelos, Mexico; Tsen-Chung Cheng, San Marino, and Chuck Y. Wu, West Covina, both of Calif., assignors to USC, Los Angeles, Calif.

Filed Dec. 4, 1981, Ser. No. 327,643
Int. Cl.⁴ G01R *5/28*
U.S. Cl. 324—72 **14 Claims**



10. A method of mapping an existing electric field, comprising:

exposing a field responsive element to the electric field to produce mechanical oscillation of the element in response to the field;

conducting a light beam to a first location along a first fiber optic waveguide, passing the beam from the first location to a second location along a path that is interrupted by movement of the element, and conducting the beam from the second location along a second fiber optic waveguide; and

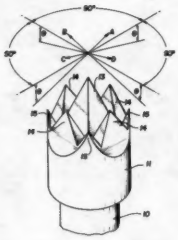
detecting modulation of the light beam by the element.

4,571,540

ELECTRICAL CONTACT PROBE

Jeffery P. Stowers, Mt. Sidney, and Thomas W. Moore, Fisherville, both of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.

Filed Sep. 14, 1983, Ser. No. 532,009
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.⁴ G01R *1/06*
U.S. Cl. 324—158 P **7 Claims**



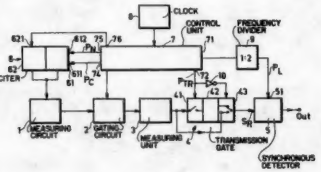
1. An electrical contact probe comprising a cylindrical leading end portion, a center leading pyramid contact point on the cylindrical portion having four triangular side faces, and a plurality of modified pyramid contact points surrounding the center leading pyramid point concentrically, the modified pyramid points being in two circumferentially alternating groups and having two heights, both heights being less than the height of the center leading pyramid point and the heights of the modified pyramid points in one group being less than the heights of the modified pyramid points in the other group, the heights of the points in each said group being the same, and the faces of each modified pyramid point converging at a single point.

4,571,541

METHOD FOR DETERMINING CHARGED ENERGY STATES OF SEMICONDUCTOR OR INSULATOR MATERIALS BY USING DEEP LEVEL TRANSIENT SPECTROSCOPY, AND AN APPARATUS FOR CARRYING OUT THE METHOD

György Ferenczi; János Boda; Ferenc Tóth; Peter Horváth, all of Budapest; László Benkovics, Dunakeszi, and László Dózsa, Érd, all of Hungary, assignors to Magyar Tudományos Akadémia Müszaki Fizikai Kutató Intézete, Budapest, Hungary

Filed Nov. 4, 1982, Ser. No. 439,226
Claims priority, application Hungary, Nov. 9, 1981, 3342/81
Int. Cl.⁴ G01R *31/26*
U.S. Cl. 324—158 D **12 Claims**

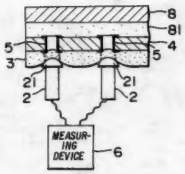


1. In a method for determining charged energy states of a sample of a semiconductor or insulator material by using deep level transient spectroscopy, having the steps of exciting said sample by the application of periodical exciting pulses to change the initial charge state thereof, detecting the transient response of said sample when it returns to the thermodynamical balance condition following the termination of each of said excitation pulses, blocking said detection during a blocking period defined as the combined existence of said exciting pulses and of a dead period including the recovery period of the means used for the detection, performing a weighted integration operation on a detected response signal by the application of a symmetrical square wave synchronizing pulse as a weighting function synchronized to the frequency of said exciting pulses, the improvement comprising the additional steps of synchronizing said synchronizing pulses to terminating moments of said dead periods to have a period time which is equal to the period time of said periodical exciting pulses and additionally blocking said detection in each of said detection periods for the duration of a further blocking period having the same length as said blocking period and terminating in moments when said synchronizing pulses are reversed between two consecutive ones of said terminating moments, said detected respones signal in said blocking periods and further blocking periods being substituted by a simulated signal for said weighted integration operation which has a value equal to that of said detected response signal immediately preceding the starting moment of said blocking period or further blocking period.

4,571,542
METHOD AND UNIT FOR INSPECTING PRINTED WIRING BOARDS

Kozo Arai, Kawasaki, Japan, assignor to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,617
Claims priority, application Japan, Jun. 30, 1982, 57-111496; Sep. 22, 1982, 57-163942; Dec. 27, 1982, 57-226595
Int. Cl.[4] G01R *31/02*; H01C *10/10*
U.S. Cl. 324—158 P **13 Claims**

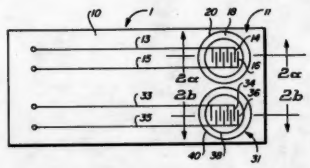


1. A method for inspecting a printed wiring board, which comprises steps of superposing, on a printed wiring board to be inspected, a pressure-sensitive, electroconductive, elastic sheet containing 5 to 20% (volume fraction) of electroconductive metal particles, any portions of which sheet become electroconductive in the direction of thickness of the elastic sheet when the portions have been pressed in the same direction, and pressing the elastic sheet at portions corresponding to those of the electroconductive portions of said printed wiring board by use of inspecting electrodes, thereby electrically connecting the intended electroconductive portions of the printed wiring board to the corresponding inspecting electrodes.

4,571,543
SPECIFIC MATERIAL DETECTION AND MEASURING DEVICE

Leonard S. Raymond, and Warren R. Jewett, both of Tucson, Ariz., assignors to Southwest Medical Products, Inc., Tucson, Ariz.

Filed Mar. 28, 1983, Ser. No. 479,712
Int. Cl.[4] G01N *27/40*
U.S. Cl. 324—425 **18 Claims**



1. A capacitive detection device for sensing the presence of and measuring the concentration of a specific gas in a gaseous fluid, the device comprising:

a capacitor having a plurality of spaced apart electrically conductive electrodes, said electrodes adapted to receive an electrical input and emit an electrical output to create a capacitive electric field therebetween;

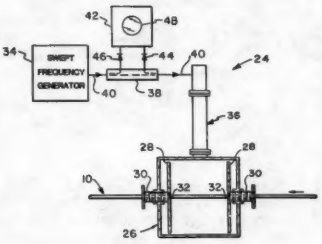
a first electrically insulative material layer passive to the gaseous fluid covering said electrically conductive electrodes; and

a second material layer covering said first material layer, said second material layer being selectively permeable to the specific gas in the gaseous fluid whereby the specific gas may be sensed and its concentration measured as a consequence of its entering the electric field between said electrodes and thereby changing the capacitance between said electrodes.

4,571,544
MICROWAVE EXAMINATION OF SEMICONDUCTIVE SHIELDS

Mark D. Walton, Hallsville, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 10, 1983, Ser. No. 550,378
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—58.5 R **2 Claims**



1. A method of continuously examining the semiconductive shield of an electrical power cable in a uniform manner, the method comprising the steps of:

providing a cavity structure capable of supporting a relatively high order coaxial mode of microwave energy at a relatively high quality factor when the cavity is dielectrically unloaded,

providing a source of microwave energy,

directing incident microwave energy to the cavity structure in a manner that excites the high order coaxial mode of the energy in the structure,

continuously directing the cable structure having at least one semiconductive shield through the cavity structure, the semiconductive material of the shield dielectrically loading the cavity structure and thereby changing the quality factor thereof such that microwave energy is reflected from the cavity,

continuously monitoring the degree of dielectric loading in the cavity structure and thus the quality factor thereof by measuring the ratio of reflected and incident energy from the cavity, and

noting any changes in said ratio.

4,571,545
SIX-PORT REFLECTOMETER

Eric J. Griffin, Malvern, and Gordon J. Slack, Amesbury, both of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, London, England

Filed Apr. 18, 1984, Ser. No. 601,448
Claims priority, application United Kingdom, Apr. 25, 1983, 8311170
Int. Cl.[4] G01R *27/06*
U.S. Cl. 324—58 B **9 Claims**

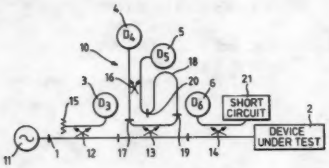
1. A six-port reflectometer including

(1) first, second and third directional coupler means arranged in sequence to provide a series path for transmission of electromagnetic waves from a source of incidence on a reflecting load and to divert samples of incident and reflected waves,

(2) a fourth directional coupler means arranged to receive a combination of incident and reflected waves from the second coupler means,

(3) a waveguide arranged to transmit incident waves from the second coupler means to the fourth coupler means, and

(4) four detector means arranged respectively to receive a proportion of incident waves from the first coupler means, a combination of incident and reflected waves from the



third coupler means and two further combinations of incident and reflected waves from the fourth coupler means.

4,571,546

DIGITAL RANDOM ERROR GENERATOR SUPPLYING BURST ERROR SIGNALS OF RANDOM DURATIONS STARTING AT RANDOM TIMES

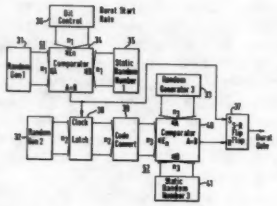
James H. Wilkinson, Tadley, Near Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,117

Claims priority, application United Kingdom, Nov. 30, 1982, 8234055

Int. Cl.[4] G06F *7/00*; H03K *3/017*

U.S. Cl. 328—61 **12 Claims**



1. A digital random error generator for generating burst error signals and comprising:

a first digital random error generator means for generating burst start signals at random times;

a second digital random error generator means for generating burst error signals of random duration;

each of said first and second digital random error generator means including a pseudo random generator for supplying a varying value n-bit output, n exclusive-OR gates having first inputs to which respective bits of said varying value n-bit output are supplied, means producing the bits of a static value n-bit number fed to respective second inputs of said exclusive-OR gates, n logic gates to which the outputs of respective ones of said exclusive-OR gates are supplied, means for selectively enabling at least one of said logic gates, and an n-input output gate having the outputs of said logic gates supplied to the respective inputs of said output gate, whereby said output gate supplies random outputs in dependence on said pseudo random generator, said static value n-bit number and said means selectively enabling said logic gates; and

means to enable the output of said second digital random error generator means in dependence on the output of said first digital random error generator means, so that said digital random error generator supplies a burst error signal of random duration starting at each said random time.

4,571,547

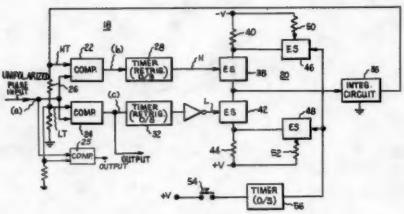
ADAPTIVE SIGNAL DETECTION SYSTEM ESPECIALLY FOR PHYSIOLOGICAL SIGNALS SUCH AS THE R WAVES OF ECG SIGNALS, WHICH IS DESENSITIZED TO ARTIFACTS

Christopher C. Day, Newtonville, Mass., assignor to Clinical Data Inc., Boston, Mass.

Filed Jun. 27, 1983, Ser. No. 508,354

Int. Cl.[4] H03K *5/153*

U.S. Cl. 328—116 **19 Claims**



1. Apparatus for detecting repetitive signals subject to amplitude variations which comprises means for detecting said signals when they exceed a threshold level, means for adaptively controlling said threshold level simultaneously in accordance with the repetition rate and amplitude of said signals, said controlling means including means for generating a control signal for setting said threshold level which is a predetermined proportion of the average value of the peak amplitude (AVP) of said signals, said controlling means includes first means responsive to the repetition rate of those of said signals having peak amplitudes which exceed said AVP of said signals for increasing said threshold level, and second means responsive to the repetition rate of those of said signals having amplitudes which do not exceed said predetermined proportion of said AVP of said signals for decreasing said threshold level.

4,571,548

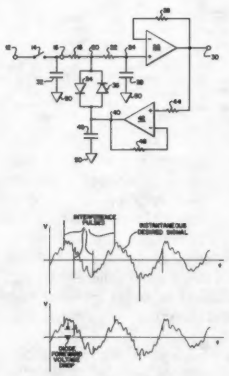
FLOATING LIMITER CIRCUIT

Lavell Jordan, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 14, 1983, Ser. No. 465,954

Int. Cl.[4] H04B *15/00, 1/10*

U.S. Cl. 328—167 **2 Claims**



1. A floating limiter circuit for reducing interference pulses in a signal, comprising:

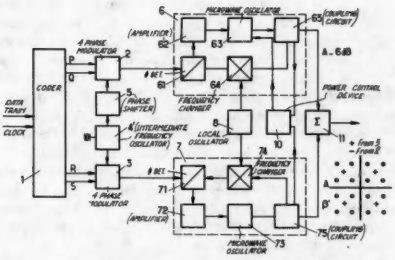
circuit input and circuit output;
first and second buffer amplifiers, each having an input and output;
a low pass filter having its input connected to the circuit input and having its output connected to the input of said first buffer amplifier;
a pair of diodes connected in parallel and in opposite polarity between the input of said low pass filter and the output of said second buffer amplifier;
means connecting the output of said first buffer amplifier to said circuit output and to the input of said second buffer amplifier; and
a capacitor connected between said output of said second buffer amplifier and a source of reference potential,
whereby the voltage at the output of said second buffer amplifier is equal to the envelope amplitude of the signal appearing at the input of said low pass filter and any interference pulses appearing at the circuit input are limited by the action of said pair of diodes and prevented from distorting the desired signal at the circuit output.

4,571,549

16-QAM MODULATOR WITH PLL AMPLIFICATION DEVICES

Jean Lods, Paris, and Christian Trinh Van, Brunoy, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Jan. 9, 1984, Ser. No. 569,482
Claims priority, application France, Jan. 7, 1983, 83 00204
Int. Cl.[4] H03C *3/00*; H04B *1/04*; H04L *23/02, 5/12*
U.S. Cl. 332—16 R **8 Claims**



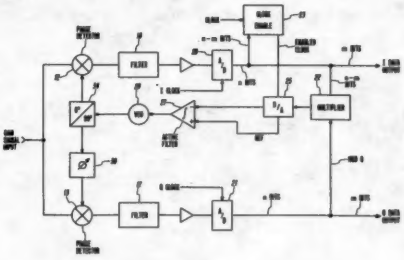
1. A 16-quadrature amplitude modulation modulator for radio links for converting a train of data into a signal having a phase selected from 16 phase values and an amplitude selected from four values, said modulator comprising
means for dividing said data train into two data sub-trains;
two four-phase modulators;
a carrier wave generator for feeding said two four-phase modulators;
means for applying said two data sub-trains respectively to said four-phase modulators;
two phase locked loops each including a voltage controlled microwave oscillator and a differential phase detector associated with said microwave oscillator, said differential phase detector being responsive to an output of one of the four-phase modulators and an output of the associated microwave oscillator for controlling said voltage controlled microwave oscillator; and
means for adding predetermined parts of the output signals of the two phase locked loops.

4,571,550

QAM DEMODULATOR CARRIER RECOVERY LOOP USING N-M LSB'S

Manley J. Head, Wylie, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1984, Ser. No. 623,801
Int. Cl.[4] H03D *3/18*; H03K *9/02*; H04L *5/12, 23/02*
U.S. Cl. 329—50 **15 Claims**



1. A system for the demodulation of a Quadrature Amplitude Modulation (QAM) signal, of the type having in-phase and quadrature channels, each having an m bit demodulated output, thereby defining a $2^m \times 2^m$ QAM vector space, said system comprising:
detector means in each of said channels, each detector means responsive to said QAM signal and a signal at a carrier frequency input, and each for generating an analog output;
an analog-to-digital converter, responsive to said analog signal in a first one of said channels, for providing said m bits and a bit group including at least the most significant one of the bits less significant than said m bits in the digital representation of the analog signal;
a phase-locked loop including said detector means in said first channel and said analog-to-digital converter, and further including
a voltage controlled oscillator responsive to an analog voltage,
hybrid means for applying the output of said voltage controlled oscillator to the carrier frequency inputs of said detector means, after in-phase and quadrature phase shifting, and
means, including a digital-to-analog converter, for deriving from said bit group a measure of the difference in phase between said demodulated output vector space and the oscillator output applied to said first channel, and for providing an analog voltage representative of said measure to said voltage controlled oscillator,
whereby said voltage controlled oscillator in said loop is controlled to provide a signal to said carrier frequency inputs which is phase locked with respect to said QAM vector space, for properly demodulating said QAM signal.

4,571,551

FLYBACK MODULATED SWITCHING POWER AMPLIFIER

Wesley H. Trager, Madison, N.J., assignor to Washington Innovative Technology, Inc., Federal Way, Wash.

Filed Feb. 28, 1984, Ser. No. 584,363
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 **21 Claims**

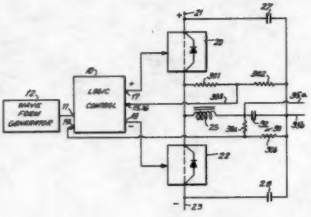
1. A flyback modulated switching power amplifier which comprises:
means for coupling to a power source;
means for coupling to an input signal;
means for coupling to an output;
capacitive means coupled across said output;
at least two power switch means each capable of controlled

conduction in one direction and uncontrolled conduction in the other and connected in series across said power source means;

inductive means coupled between the junction of said power switch means and said output means;

voltage comparator means coupled to said output means and input signal means for producing a comparator signal representative of the relative voltage of said input signal and output;

conduction feedback means coupled to said power switch



means for producing a conduction feedback signal representative of the conductive state of said power switch means; and

logic control means for selectively actuating said power switch means in response to said comparator signal and said conduction feedback signal so that one of said power switch means is not actuated while flyback current is flowing from the inductor means through the other power switch means in the uncontrolled direction and so that said power switch means are activated to cause said output to essentially track said input signal.

4,571,552

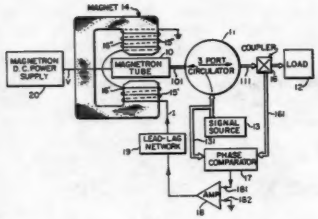
PHASE-LOCKED MAGNETRON SYSTEM

William C. Brown, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 549,128, Nov. 7, 1983, abandoned. This application Jul. 2, 1985, Ser. No. 750,990

Int. Cl.[4] H03F *3/54;* H03L *7/00*

U.S. Cl. 330—47 **9 Claims**



6. A magnetron phase locking system comprising:

a magnetron having means for providing a magnetic field;

an input signal source;

means for providing said input signal to said magnetron; and

means for comparing the phase of the output signal of said magnetron and said input signal to provide an error signal which is provided to said magnetic field means to change the strength of said magnetic field in response to said error signal to thereby lock the frequency of said magnetron to said signal source.

4,571,553

AMPLIFIER CIRCUIT WITH DISTORTION CANCELLATION FUNCTION

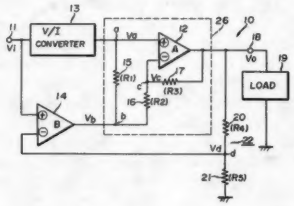
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 6, 1984, Ser. No. 678,693

Claims priority, application Japan, Dec. 14, 1983, 58-235955

Int. Cl.[4] H03F *1/26*

U.S. Cl. 330—149 **8 Claims**



1. An amplifier circuit with distortion cancellation function comprising:

(a) input terminal means for receiving an input signal to be amplified;

(b) main amplifier means for amplifying said input signal, said main amplifier means having an input terminal for being supplied with a signal proportional in signal level to said input signal, a reference voltage input terminal for being supplied with a reference voltage, and an output terminal for outputting an output signal thereof, a voltage potential of the input terminal of said main amplifier means at the time when a signal level of said input signal is zero being determined by said reference voltage;

(c) impedance circuit means for being supplied with said output signal of said main amplifier means;

(d) differential amplifier means for supplying an output signal thereof to said reference voltage input terminal as said reference voltage, one of input terminals of said differential amplifier means being supplied with the output signal of said main amplifier means through said impedance circuit means, the other of the input terminals of said differential amplifier means being supplied with said input signal to be amplified, an output terminal of said differential amplifier means being coupled to the reference voltage input terminal of said main amplifier means; and

(e) output terminal means for deriving the output signal of said main amplifier means therefrom;

wherein said main amplifier means is a current input type amplifier in which the input terminal is controlled by a current of said input signal;

wherein said main amplifier means has a transfer function of one (1) between said reference voltage input terminal and said output terminal;

wherein said main amplifier means comprises a first resistor, a second resistor having a resistance value R2, a third resistor having a resistance value R3, and an amplifier having an open-loop gain A and having inverting input, non-inverting input and output terminals, said non-inverting input terminal being connected to the input terminal of said main amplifier means, said first resistor being connected between said non-inverting input terminal and said reference voltage input terminal, said second resistor being connected between said inverting input terminal and said reference voltage input terminal, said third resistor being connected between the inverting and output terminals of said amplifier;

wherein said differential amplifier means has a voltage gain B; and

wherein said impedance circuit means comprises a fourth resistor having a resistance value R4 and a fifth resistor having a resistance value R5, said fourth and fifth resistors

being serially connected in this order between the output terminal of said main amplifier means and ground, a junction point of said fourth and fifth resistors being connected to said one of the input terminals of said differential amplifier means, and wherein

$R2/(R2+R3)=R5/(R4+R5)$,

$A>>0$, and

$B>>0$.

4,571,554

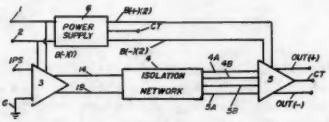
BALANCED AMPLIFIER DEVICE

Hardison G. Martin, and Robert Ponto, both of Louisville, Ky., assignors to Innovative Electronic Designs, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 283,128, Jul. 14, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 543,923

Int. Cl.⁴ H03F *3/45*

U.S. Cl. 330—252 **8 Claims**



1. A signal amplifier providing output power in response to change in output impedance including audio signal input source means to provide an input signal; a first power supply means to receive power from a power supply source and having a transformer with a secondary coil and a reference output from the secondary coil, to supply a reference signal; first and second amplifier means connected as a differential amplifier pair each having signal input means wherein at least one of said first and second amplifier means receives a portion of said input signal and where said first and second amplifier means are powered by said power supply source and each includes signal output means to provide complementary first and second balanced signals, first and second output amplifiers connected as a parallel differential amplifier pair each having a signal output means and signal input means to receive one of said complimentary first and second balanced signals and amplify same to provide first and second outputs signals respectively where said first and second output amplifiers power from said first power supply and receive said reference signals from said reference output so that the power supplied to the first and second output amplifiers changes upon change in impedance at one of said first and second amplifier signal outputs.

4,571,555

RE-ENTRANT COAXIAL CAVITY POWER COMBINER

Bernard E. Sigmon, and Charles V. Evans, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1984, Ser. No. 595,019

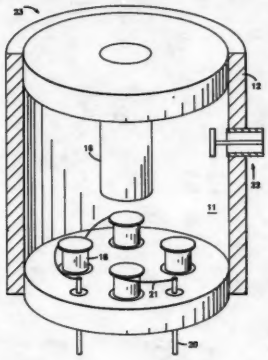
Int. Cl.⁴ H03B *7/14*

U.S. Cl. 331—56 **15 Claims**

1. Power combining apparatus comprising:

housing means forming a cylindrical coaxial tuned cavity therein;

a cantilevered center conductor cylinder coupled to said housing means extending axially into the cavity of said housing means; and



a plurality of negative resistance devices extending axially into the cylindrical coaxial tuned cavity of said housing means opposite said center conductor cylinder.

4,571,556

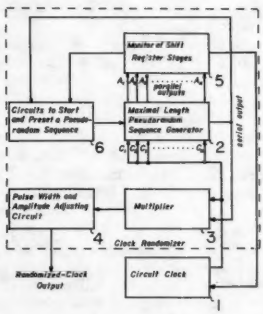
RANDOMIZED-CLOCK CIRCUIT

Hans R. Gnerlich, Bethlehem, Pa., and Kuno P. Zimmermann, Kansas City, Mo., assignors to MI Medical & Scientific Instruments, Inc., Bethlehem, Pa.

Filed Jul. 28, 1983, Ser. No. 517,969

Int. Cl.⁴ H03B *29/00*; A61N *1/32*

U.S. Cl. 331—78 **9 Claims**

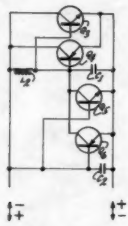


1. A randomized-clock circuit comprising a maximal length pseudorandom sequence generator (MLPSG), a periodic circuit clock, a multiplier, a circuit to start a pseudorandom sequence and a pulse width and amplitude adjusting circuit, the multiplier, multiplying the output of the MLPSG with the output of the periodic circuit clock, is providing at its output a random pulse train of known sequence length and gap statistics with truncated exponential distribution, the MLPSG comprises an N-stage shift register, selected stages of which are mod-2 fed back to the input of the MLPSG, wherein the feedback satisfies a primitive, irreducible polynominal of degree N, the circuit to start a psueudorandom sequence is sending a starting pulse to the MLPSG if the MLPSG is in a state in which it does not produce pulse sequences, the pulse width and amplitude adjusting circuit is regulating the width, amplitude, shape and power of the pulses of the random sequence.

4,571,557
WIDE BAND TRANSISTOR OSCILLATOR

Randy Brandt, 1607 Dressage, Orange, Calif. 92669

Filed Mar. 26, 1984, Ser. No. 593,524
Int. Cl.[4] H03R *5/18*; H03C *3/28*
U.S. Cl. 331—96 20 Claims



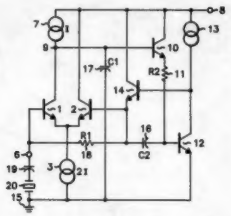
1. An electronic oscillator which comprises:
a first and a second electrical control means, each of said electrical control means including a current emitting functionality, a current control functionality and a current collecting functionality, each of said electrical control means exhibiting the property of a space charge effect between said current emitting functionality and said current control functionality and the property of a transconductance effect between said current controlling functionality and said current collecting functionality;
a first electrical connector between the current controlling functionality of said first electrical control means and the current collecting functionality of said second electrical control means;
a second electrical connector between the current controlling functionality of said second electrical control means and the current collecting functionality of said first electrical control means;
an induction means associated between said first and said second electrical connectors;
a first lead means connecting to the current emitting functionality of both said first and said second electrical control means;
a second lead means connecting to one of said first and said second electrical connectors;
a power source means for supplying power, said power source means in operative electrical association with said first and said second lead means; and
wherein the space charge between said current emitting functionalities and said current control functionalities of said first and said second electrical control means constitutes the dominant capacitance of said oscillator whereby the frequency of oscillation of the oscillator is determined by the combination of the inductance of said inductor means, the space charge of said first and said second electrical control means and the current supplied by said power means.

4,571,558
VOLTAGE CONTROLLED CRYSTAL OSCILLATOR WITH REDUCED OSCILLATIONS AT CRYSTAL OVERTONES

Michael J. Gay, and Johannes Gutmann, both of Vaud, Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1984, Ser. No. 665,806
Claims priority, application United Kingdom, Nov. 1, 1983, 8329131
Int. Cl.[4] H03B *1/04, 5/36*
U.S. Cl. 331—105 11 Claims

1. A crystal controllable oscillator circuit comprising an amplifier having an input for coupling a crystal resonator thereto and having an output, an oscillation sustaining feedback loop coupled between the output and the input of the amplifier, the loop including a first integrator and a second

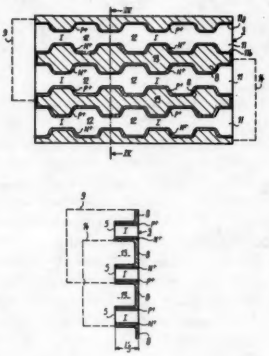


integrator fed from the first integrator whereby overtone oscillations are inhibited.

4,571,559
HIGH-POWER WAVEGUIDE LIMITER COMPRISING PIN DIODES FOR MILLIMETER WAVES

Raymond Henry, Fontenay aux Roses; Michel Heitzmann, Combs la Ville, and Jean V. Bouvet, Creteil, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 11, 1984, Ser. No. 659,844
Claims priority, application France, Oct. 14, 1983, 83 16388
Int. Cl.[4] H01P *1/22*
U.S. Cl. 333—17 L 5 Claims

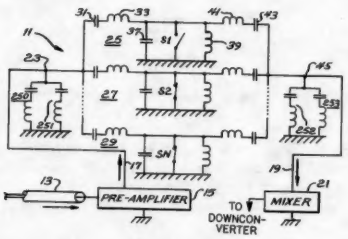


1. A high-power limiter comprising:
a rectangular waveguide having a longitudinal axis (Δ), having dimensions permitting propagation of millimeter waves,
a silicon substrate of parallelepipedic form and rectangular cross-section substantially of the same dimensions as those of the cross-section of the guide, installed in the guide transversely to the longitudinal axis of the same,
a series-parallel array of silicon PIN diodes of the same dimensions, produced in the surface of the substrate, the diodes being situated facing the input of power into the guide, and the dimension of the silicon substrate along the longitudinal axis (Δ) of the waveguide being equal to that of the silicon area I of each of the PIN diodes along the same axis (Δ).

4,571,560
SWITCHED BANDPASS FILTER

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 21, 1985, Ser. No. 736,504
Int. Cl.[4] H03H 7/01
U.S. Cl. 333—174 20 Claims



1. A switchable filter for selectively passing one of a plurality of frequency bands, wherein each frequency band is characterized as having a center frequency of f1, . . . fn, said switchable filter comprising:

an input terminal to which a signal to be filtered is provided;

an output terminal from which a band filtered signal is provided;

a plurality of grounded parallel resonant circuits;

a plurality of series resonant input circuits each coupling a respective one of said grounded parallel resonant circuits to said input terminal;

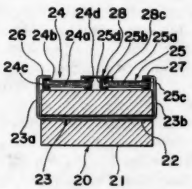
a plurality of series resonant output circuits each coupling a respective one of said grounded parallel resonant circuits to said output terminal, wherein each combination of respective series resonant input, grounded parallel resonant, and series resonant output circuits forms a triple tuned bandpass filter section tuned to one of said center frequencies f1, . . . fn; and

a plurality of switch means each connected across a respective grounded parallel resonant circuit for shunting all but one of said grounded parallel resonant circuits with the triple tuned filter section associated with the unshunted parallel resonant circuit tuned to the center frequency of a desired frequency band, wherein the series resonant input and output circuits of the shunted triple tuned bandpass filter sections are tuned to respective notch frequencies outside the desired frequency band.

4,571,561
NOISE REDUCTION FILTER

Yasuo Fujiki, and Toshio Hori, both of Takefu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 29, 1984, Ser. No. 645,310
Claims priority, application Japan, Sep. 5, 1983, 58-138656[U]
Int. Cl.[4] H03H 7/01
U.S. Cl. 333—184 5 Claims

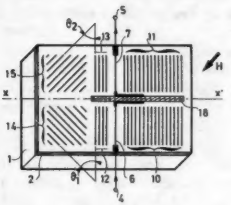


1. A noise reduction filter which comprises a block of magnetizable material, first and second capacitors each having first and second terminal electrodes opposite to each other, said first and second capacitors being mounted on one surface of the block with the second terminal electrodes of the respective first and second capacitors confronting with each other, a first electrode member in the form of a strip partially extending through the block with its opposite end portions being connected to the first terminal electrodes of the respective first and second capacitors, and a second electrode member in the form of a strip mounted on the block with a portion thereof electrically connecting the second terminal electrodes of the respective first and second capacitors together, wherein said block has a single through-hole defined therein, a substantially intermediate portion of said first electrode member between said opposite end portions thereof extending through said through-hole.

4,571,562
TUNABLE SELECTIVE DEVICES BASED FOR MAGNETOSTATIC VOLUME WAVES

Jean-Paul Castéra, Orsay, France, assignor to Thomson-CSF, Paris, France

Filed May 25, 1984, Ser. No. 614,148
Claims priority, application France, May 27, 1983, 83 08829
Int. Cl.[4] H03H 9/00, 9/24
U.S. Cl. 333—186 8 Claims



1. A tunable selective device based on magnetostatic volume waves, comprising:

a magnetic layer having at least one resonator formed therein, wherein said at least one resonator has a reflector network formed by first plurality of grooves cut into said magnetic layer and wherein said reflector network is associated with a return reflector network formed by a second plurality of grooves cut into said magnetic layer and wherein said return reflector network is external to said resonator, wherby said return reflector network assures the transmission by reflection of magnetostatic waves output from said resonator having said reflector network in order to establish a required longitudinal mode, as well as other longitudinal modes bordering said required longitudinal mode;

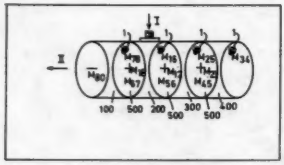
said return reflector network being constructed and devised in such a manner that the magnetostatic waves can be reflected by each of said second plurality of grooves and wherein a reference pass band is formed by said return reflector network so that the period of traversal of said return network by said magnetostatic waves is the reciprocal of said reference pass band; and wherein said pass band is centered on said required longitudinal mode and is sufficiently narrow to exclude said other longitudinal modes.

4,571,563

INTEGRATED MICROWAVE FILTER AND METHOD OF CONSTRUCTING SAME

Richard J. Cameron, Noordwijk, Netherlands, assignor to Agence Spatiale Europeenne, Paris, France

Filed Jan. 23, 1984, Ser. No. 573,060
Claims priority, application Belgium, Nov. 18, 1983, 0/211894
Int. Cl.[4] H01P 1/208, 1/161
U.S. Cl. 333—212 2 Claims



1. A method of constructing an n-th degree microwave filter of the type formed of cascaded dual-mode rsonance cavities tuned to the geometric center frequency of the passband frequency range of the filter and with each cavity providing coupling between the resonance modes thereof and having cruciform irises for coupling adjacent cavities to each other, said method comprising the steps of:

(a) supplying to a data processing device the numerator and denominator polynomials representing the transfer characteristic of an ideal n-th degree Butterworth filter,

(b) supplying to said data processing device finite locations on the complex s-plane of transmission zeros of said transfer characteristic for varying at least one of said numerator and denominator polynomials to modify said transfer characteristic and produce attenuation poles in the direction of the imaginary axis of said s-plane and change the group delay characteristic of said transfer characteristic,

(c) determining the group delay characteristic of the modified transfer characteristic,

(d) storing a desired group delay characteristic,

(e) comparing said determined group delay characteristic to said stored group delay characteristic and producing a difference therebetween,

(f) repeatedly altering the locations on the complex s-plane of said transmission zeros to further modify said transfer characteristic, said locations being altered in a direction to reduce said difference to a minimum value,

(g) determining the susceptances of the respective cruciform irises as a function of the modified transfer characteristic which resulted in said minimum value difference, and

(h) cutting the arms of the respective cruciform irises to lengths corresponding to said determined susceptances.

4,571,564

APERTURE-COUPLED MICROWAVE APPARATUS

Maciej E. Znojkiewicz, Mount Royal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 15, 1983, Ser. No. 532,543
Claims priority, application Canada, May 16, 1983, 428268
Int. Cl.[4] H01P 5/00, 7/06; H04B 1/26
U.S. Cl. 333—230 5 Claims

1. Microwave apparatus comprising:

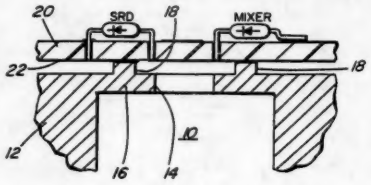
a cavity defined by walls;

an aperture through one wall of the cavity;

an insulating support extending across the aperture and having a surface which faces toward the cavity and a surface which faces away from the cavity;

a plurality of mutually spaced conductive fingers on the surface of the support which faces toward the cavity;

a first ground plane on the surface of the support which faces toward the cavity, co-planar with, surrounding, and insulated from the conductive fingers; and a second ground plane on the surface of the support which faces away from the cavity, overlying the conductive fingers;



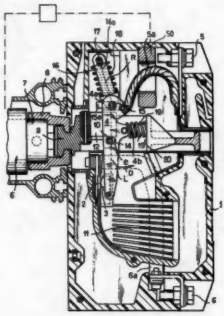
wherein the conductive fingers are disposed over the aperture such that said fingers can couple magnetically with radio frequency energy in the cavity.

4,571,565

CONTROLLED OPENING AND CLOSING SWITCH WITH AUTOMATIC OPENING IN THE EVENT OF CURRENT OVERLOAD

Elie Belbel, Epinay; Andreé Haury, Le Raincy; Christian Blanchard, Nanterre, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, Nanterre, France

PCT No. PCT/FR84/00003, § 371 Date Aug. 14, 1984, § 102(e) Date Aug. 14, 1984, PCT Pub. No. WO84/02802, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 4, 1984, Ser. No. 639,417
Claims priority, application France, Jan. 5, 1983, 83 00086
Int. Cl.[4] H01H 77/02, 75/10
U.S. Cl. 335—16 11 Claims



1. A switch designed to open and close under the action of a control device such as an electromagnet (6, 7, 28, 29) and to open automatically in the event of overload current flow through the switch, said switch being provided with a stationary contact (2, 22) and a moving contact (3, 23) subjected to the action of a magnetic component (12, 31) which serves to increase the pressure applied by the moving contact on the stationary contact below a predetermined current threshold value as well as a mechanical threshold device (18, 37) which trips and initiates opening of said contacts when the magnetic component exerts on the moving-contact rocker-arm a force which exceeds the force corresponding to the aforementioned current threshold value, wherein the moving contact (3, 23) is carried by a rocker-arm (4, 24) pivotally mounted on a first pin (10, 25) which is rigidly fixed to the control device (6, 29), the opposite end (4a, 24a) of said rocker-arm with respect to the end which carries the moving contact being provided with a second pivot-pin (15, 39) which is connected to the mechanical threshold device (18, 37), said second pivot-pin being capable of moving between a normal position which is maintained by

the threshold device and in which the moving contact (3, 23) is either capable or not capable of cooperating with the stationary contact according as the control device is active or inactive and a tripped position with respect to the threshold device in which the contacts are separated even when said control device is active, wherein the magnetic component (12, 31) occupies with respect to the rocker-arm (4, 24) a position such as to exert on said rocker-arm a torque which is a function of the current flowing through the contacts, thereby increasing the contact pressure prior to tripping of the threshold device and producing a pivotal displacement of the rocker-arm about its pivot-pin (10, 25) which is rigidly fixed to the control device in the direction of opening of the contacts after tripping of said threshold device.

4,571,566
ELECTROMAGNETIC RELAY

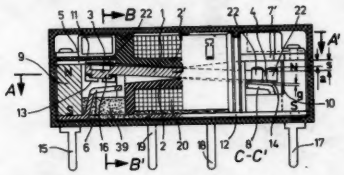
Hans Saür, Fichtenstrasse 5, F-8024 Deisenhofen, Fed. Rep. of Germany, assignor to Matsushita Electric Works, Ltd., Japan and Hans Saür, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 546,057

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240800

Int. Cl.⁴ H01H *50/04*

U.S. Cl. 335—78 **19 Claims**



1. Electromagnetic relay comprising

a coil,

a permanent magnet provided with pole pieces which are electrically insulated from each other,

a soft-magnetic electrically conductive pivotally mounted armature exposed to the magnetic flux of said permanent magnet and to the magnetic flux produced by said coil when energized, and having ends cooperating with said pole pieces to form a main contact for primary current conduction, and

resilient contact springs carried on the ends of said armature opposite said pole pieces and adapted to form an initial contact with the same, said contact springs and the portions of the pole pieces forming said initial contact with said contact springs being provided with a material resistant to burning, and the portion of said armature and pole pieces forming said main contact with each other being provied with a noble metal,

wherein, when said coil is energized to move said armature to a contact-making position, said initial contact is made first between the respective one of said contact springs and the respective pole piece and then, upon bending of said contact spring, said main contact is made between said armature end and the respective pole piece cooperating therewith.

4,571,567
ELECTROMAGNETIC RELAY

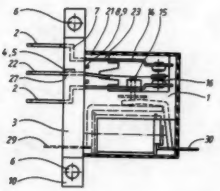
Wolfgang Nestlen, Rottweil, and Michael Scheffler, Wehingen, both of Fed. Rep. of Germany, assignors to Hengstler GmbH Geschaftsbereich, Haller-Relais, Wehingen, Fed. Rep. of Germany

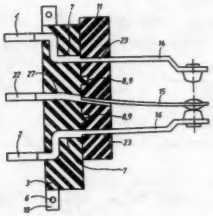
Filed May 29, 1984, Ser. No. 614,535

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319927

Int. Cl.⁴ H01H *51/06*

U.S. Cl. 335—128 **8 Claims**





1. A miniature relay comprising,

a first component including a magnetic coil and a spring set operably associated therewith, the spring set including a plurality of contact springs at least certain ones of which are flexed in a switching operation by actuation of the coil,

a second component mounted to the first component, in which the contact springs are securely and fixedly mounted at one end of the contact springs, with their other ends extended in an inner direction for flexing by actuation of the coil,

said second component including a spring mount and an adapter plate formed as separate pieces and detachably secured together as a unit, and having interlocking elements locating them in a predetermined position in transverse directions,

the contact springs having plug elements extending in an outer direction from the second component, and

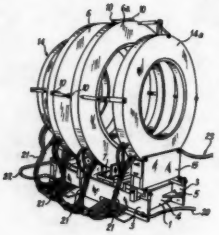
the contact springs and the second component respectively having positive interengaging elements for preventing movement of the contact springs in said inner direction in response to force in that direction against the plug elements,

the interengaging elements in the second component being formed respectively on the spring mount and adapter plate.

4,571,568
DEVICE FOR MAINTAINING AND FIXING COILS PROVIDED FOR MAKING A CONSTANT AND HOMOGENEOUS MAGNETIC FIELD

Jean A. M. Grangereau, Orsay, France, assignor to Drusch et Cie, Rueil-Malmaison, France

Filed Feb. 17, 1984, Ser. No. 581,343
Claims priority, application France, Feb. 21, 1983, 83 02757
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—299 5 Claims



1. A device for fixing and maintaining coils contained within armatures for making a constant and homogeneous magnetic field, said device comprising:

an amagnetic bench having a longitudinal axis,

a first frame mounted on said bench, said frame comprising two upstanding panels,

a first armature firmly secured by said panels, said armature containing an electrical element used as a reference electric coil, said electrical element being mounted within said first armature,

at least two additional armatures for support longitudinally along, and by, said bench, each of said additional armatures having a diameter less than or equal to that of said first armature,

means, supported at locations on said bench spaced from said first frame, for mounting said additional armatures so that they may be placed, relative to one another and said first armature, on the periphery or an imaginary sphere, said mounting means including means for adjusting said additional armatures relative to said first armature in longitudinal and vertical directions, and

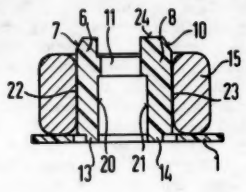
threaded adjustment means, disposed between and interconnecting adjacent armatures, for maintaining said additional armatures in spaced, vertical dispositions relative to said first armature.

4,571,569
MOUNTING FOR AN ESPECIALLY CURRENT-COMPENSATED, FERRITE RING-CORE CHOKE

Werner Scharl, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,890
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330881
Int. Cl.[4] H01F 15/02, 27/26
U.S. Cl. 336—65 7 Claims

1. Mounting and current-compensated ferrite ring core choke, comprising an insulating material plate, and a potential-isolating device, said potential-isolating device including straps fastened upright on said insulating material plate, and a resilient ring interconnecting said straps, said straps having inner edges facing each other and outer edges, the ferrite ring core choke being slipped on said potential-isolating device with said outer edges of said straps resting resiliently against the ferrite

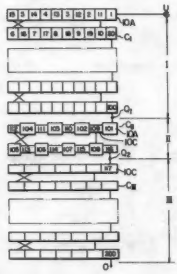


ring core and windings on different sections of the ring core physically separated from each other.

4,571,570
WINDING FOR STATIC INDUCTION APPARATUS

Atsushi Miki; Etsunori Mori; Minoru Hoshi, and Masaru Higaki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 240,858, Mar. 5, 1981, abandoned. This application Oct. 5, 1984, Ser. No. 658,413
Claims priority, application Japan, Mar. 5, 1980, 55-26666
Int. Cl.[4] H01F 15/14
U.S. Cl. 336—70 3 Claims

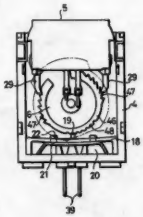


1. A winding for a static induction apparatus comprising a plurality of interleaved coils each formed by winding a strand conductor in a radial spiral, said coils being stacked in the axial direction of said coils and electrically connected in series from a line terminal side to another terminal side, wherein said winding is divided into at least three blocks each including a plurality of ones of said interleaved coils each of the interleaved coils which belong to a first one of said blocks located on said line terminal side being formed by winding a first type strand conductor having a reduced dimension in the radial direction of said coil and an increased dimension in the axial direction of said coil, while each of the interleaved coils which belong to a second one of said blocks located closer to said other terminal side is formed by a second type strand conductor which has an increased dimension in the radial direction of said coil and a reduced dimension in the axial direction in contrast to the dimensions of said first type strand conductor and has an electrically effective cross-sectional area substantially equal to that of said first type strand conductor, each of the interleaved coils belonging to a third one of said blocks interposed between said first and second blocks being formed by winding a pair of said first and second type strand conductors disposed adjacent to each other, the number of turns of each of the interleaved coils belonging to said second block being decreased as compared with that of each of the interleaved coils belonging to said first block.

4,571,571
VARIABLE RESISTOR ACUATED BY PIVOTAL ACTUATOR

Masahiro Onodera, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,351
Claims priority, application Japan, Mar. 9, 1983, 58-32774[U]; Mar. 9, 1983, 58-32775[U]
Int. Cl.⁴ H01C *10/32*
U.S. Cl. 338—162 **4 Claims**

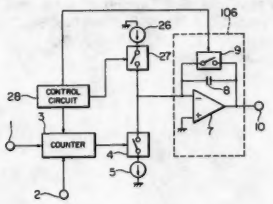


1. A variable resistor comprising:
(a) a casing;
(b) an actuator having an intermediate portion pivotally supported by said casing, a pair of opposite actuating end portions exposed from said casing, and a pair of opposite feed pawls;
(c) a rotor pivotally supported by said casing between said opposite feed pawls, said rotor having on peripheral edges thereof teeth meshing with said feed pawls and carrying a slider;
(d) a resistor base plate mounted on said casing and having an arcuate resistor layer facing said slider of said rotor; and
(e) said actuator adapted to be pivoted in response to depression of one at a time of said actuating end portions thereof for turning said rotor in one direction through meshing engagement between said feed pawls and said teeth to thereby cause said slider to slide on said arcuate resistor layer, whereby the resistance of said variable resistor can be varied.

4,571,572
DIGITAL/ANALOGUE CONVERTER

Tsutomu Noda; Yoshimi Iso, both of Yokohama, and Tetsuo Sato, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,258
Claims priority, application Japan, Mar. 28, 1984, 59-58231
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 DA **7 Claims**

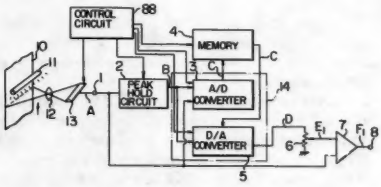


1. A digital-to-analogue converter for converting a digital signal to an analogue signal, comprising:
integrating means for integrating an input current thereto and outputting an analogue signal representative of the result obtained through integration of said input currents;
first constant current generating means for supplying a first predetermined constant current to said integrating means in a first predetermined direction;
first switch means for controlling the period during which said first predetermined current is supplied to said integrating means;
second constant current generating means including a second constant current source for supplying a second predetermined constant current to said integrating means in a second direction opposite to said first predetermined direction, said input current corresponding to a sum of said first and second predetermined constant currents;
second switch means for controlling the period during which said second predetermined constant current is supplied to said integrating means;
first switch controlling means for responding to the digital signal to make said first switch means conductive during a period corresponding to said digital signal; and
second switch controlling means for controlling said second switch means.

4,571,573
APPARATUS FOR CONVERTING AN ANALOG SIGNAL TO A BINARY SIGNAL

Masaharu Tadauchi; Kunio Sato, both of Hitachi; Kiyohiko Tanno, Katsuta; Hiroshi Suehiro, and Yasuo Inoue, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,549
Claims priority, application Japan, Oct. 27, 1981, 56-170773
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 340—347 AD **11 Claims**

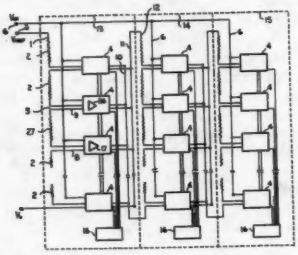


1. An apparatus for converting an analog input signal having a component corresponding to a background and shading profile to a binary output signal, comprising:
means for producing at its output terminal an analog reference signal from said analog input signal received at its input terminal, said analog reference signal being determined on the basis of said background and shading profile component of said analog input signal;
means connected with said analog reference signal producing means for detecting the difference in amplitude between said analog input signal and said analog reference signal and for dividing said difference to produce a correction signal;
comparison reference signal producing means including first means connected with said difference detecting and dividing means for adding to or subtracting from said analog reference signal said correction signal depending on whether the amplitude of said input signal is larger or smaller than that of said analog reference signal to adjust said analog reference signal and second means for suppressing and delaying any rapid change of the so adjusted analog reference signal, thereby producing a comparison reference signal; and
means for comparing the amplitude of said input signal with that of said comparison reference signal to generate said binary output signal.

4,571,574
ANALOGUE TO DIGITAL CONVERTER

Witold Krynicki, 321 W. Le Roy Ave., Arcadia, Calif. 91006

Filed Sep. 30, 1982, Ser. No. 429,846
Int. Cl.[4] H03K *13/175*
U.S. Cl. 340—347 AD 2 Claims

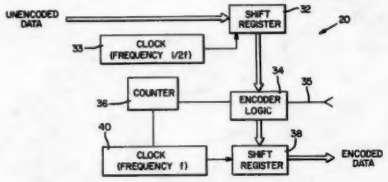


1. An analogue to digital converter comprising:
a reference voltage divider with a plurality of fixed unit resistor elements, disposed as a resistor ladder network,
a comparator at each resistor-resistor junction of said resistor elements on said voltage divider, one terminal of said comparator being connected to each of said resistor-resistor junctions,
a reference voltage across the voltage divider, generating equal voltage increments in said voltage divider and causing said comparators to be biased to corresponding voltage increments,
an input voltage connected to a second terminal of all said comparators, and causing all comparators that are below the reference voltage-divider threshold to turn on, while all comparators above the threshold remain off,
switching means connected between said resistors and said resistor-resistor junction and operable to disconnect said resistor element located between said comparator just below the reference voltage threshold and said comparator at just above the reference voltage threshold,
a second voltage divider comprising a resistor-ladder of total resistance value equal to the resistance of one said unit resistor element of said first reference voltage divider, and also comprising a plurality of fixed unit resistor elements of higher resolution, and comparators at each resistor-resistor junction thereof, said reference voltage then being subdivided in said second voltage divider, into incremental voltages and in the corresponding comparators into incremental thresholds, causing those comparators that are at a freshold below the reference voltage to turn on, while all the comparators above the threshold will remain off,
switching means to connect the resistor-resistor junction of the first of said comparators that have turned on, and the resistor-resistor junction of the first of said comparators that have remained off, across the resistor-ladder of said second voltage divider,
encoder means coupled to said comparators of the first voltage divider to encode the outputs of the comparators of said first voltage divider, and
second encoder means coupled to said comparators of said second voltage divider to encode the comparator outputs of said second voltage divider.

4,571,575
SYNCHRONIZATION-PROMOTING DATA CODING METHOD

Robert B. McCullough, Sunol, Calif., assignor to Sunol Systems Incorporated, Pleasanton, Calif.

Filed May 3, 1984, Ser. No. 606,876
Int. Cl.[4] H03K *13/24*
U.S. Cl. 340—347 DD 1 Claim

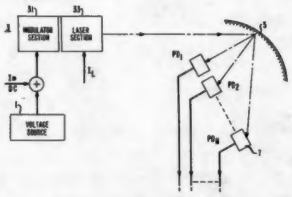


1. A method for run-length-limited encoding a string of input binary bits, which string includes a sequence of at least three synchronizing bits all having a value of binary zero for use in determining the frequency of occurrence of the string of input bits, for recording encoded bits on a magnetic storage medium in a selected region having a synchronization field for storing encoded synchronizing bits, a binary one being represented on the medium as a magnetic flux transition and a binary zero as a lack of flux transition, said method comprising the steps of
serially receiving such a string of input bits,
serially dividing the string of input bits into groups of bits belonging to a set of unique bit groups containing, when concatenated, all possible combinations of bits, the set including a group of three consecutive binary zero bits,
replacing each group with a corresponding collection of encoded bits, a unique collection of encoded bits existing for each unique bit group, the collections of encoded bits having, when concatenated, a minimum of two and a maximum of seven consecutive bits with a value of binary zero, said step of replacing including replacing each divided group of three input binary zeros into a collection of six encoded bits having two binary ones separated by two binary zeros,
serially transmitting the collections of encoded bits for recording the same on the medium in the same sequence as the corresponding input bit groups are received, and
by said foregoing steps, producing a sequence of encoded bits for each such sequence of synchronizing bits which, when recorded on a magnetic storage medium, have a maximum number of flux transitions.

4,571,576
HIGH SPEED ANALOG-TO-DIGITAL CONVERTER

Nils A. Olsson, and Chandra K. N. Patel, both of Summit, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1983, Ser. No. 546,991
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD 11 Claims



1. An analog-to-digital converter comprising a laser, said

laser having at least one electrode for receiving an input voltage, and emitting radiation at a frequency determined by said input voltage to said laser;

an array of photodetectors; and

wavelength dispersive means directing said radiation from said laser to said array photodetectors, each photodetector receiving radiation of one wavelength, said array giving rise to signal outputs representing a digitized signal.

4,571,577

METHOD AND APPARATUS FOR DETERMINING THE COORDINATES OF A POINT ON A SURFACE

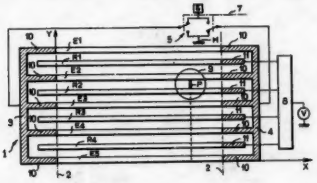
Pierre Taupin, Maubeuge; Claude Goguillon, Boussois sur Sambre, and Frédéric de Moncuit, Paris, all of France, assignors to Boussois S.A., Levallois Perret, France

Filed Jan. 25, 1983, Ser. No. 460,902

Claims priority, application France, Jan. 27, 1982, 82 01234

Int. Cl.[4] G08C *21/00*

U.S. Cl. 340—347 R 8 Claims



1. A method for determining coordinates of a conducting object on a surface, said conducting object establishing an electrical bridge on said surface between one emitter strip and one receiver strip of a pattern comprising parallel emitter strips lying on said surface and simultaneously connected to a voltage generator, and parallel receiver strips lying on said surface alternately with said emitter strips, said method comprising the steps of:

(a) cyclically exploring said receiver strips one after the other and detecting the receiver strip which has a voltage different from the other receiver strips, said detected receiver strip being representative of one coordinate (Y) of said conducting object,

(b) measuring the voltage of said detected receiver strip and comparing said measured voltage with the voltage of said voltage source, said measured voltage being representative of another coordinate (X) of said point on said surface.

4,571,578

INTRUSION BARRIER AND DETECTION APPARATUS

Nicholas V. Karas, Lowell, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1983, Ser. No. 486,478

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—541 8 Claims

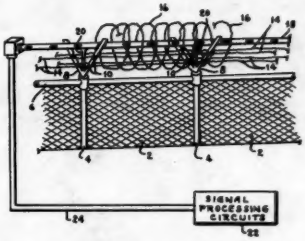
1. An intrusion barrier and detector comprising:

a coil of wire,

a ported coaxial cable positioned within said coil of wire and extending along the length thereof,

and a radio frequency signal transceiver system coupled to said ported coaxial cable,

said radio frequency transceiver system being adapted to transmit radio frequency energy to said ported coaxial cable and to receive radio frequency signals from said ported coaxial cable indicative of physical disturbances of said coil of wire,



said coil of wire having an interturn spacing not exceeding 0.1λ, where λ is the wavelength of said radio frequency energy.

4,571,579

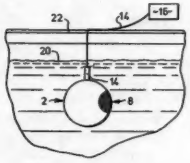
SWIMMING POOL ALARM

Edward N. Woolley, 6 Holloway Rd., Islington, Ontario, Canada (M9A 1E8)

Filed Feb. 13, 1984, Ser. No. 579,576

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—566 9 Claims



1. A swimming pool alarm comprising a sensor head for suspension in a swimming pool in a position submerged substantially beneath the water surface of the pool, the sensor head comprising an electrical resonator element housed within the head and means maintaining a movable element captive adjacent the resonator element, the movable element being agitatable responsive to movement of the watedr of the pool whereby to promote resonance of the resonator element, and an alarm device external of the pool and responsive to a predetermined amplitude of resonance of the resonator element.

4,571,580

SONIC TEMPERATURE WARNING DEVICE FOR LIDS OF COOKING VESSELS

Hans R. Winteler, Chemin des Granges, 1261 Arzier, and Charles-Andrés Favre, Chemin Cassinette 2, 1018 Lausanne, both of Switzerland

Filed Apr. 18, 1984, Ser. No. 601,659

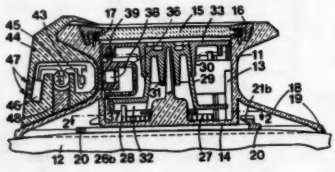
Claims priority, application Switzerland, Apr. 29, 1983, 2335/83

Int. Cl.[4] G08B *17/06*

U.S. Cl. 340—594 7 Claims

1. A sonic temperature warning device for lids of cooking vessels comprising a housing (11) which functions as a lid knob, means for fastening this housing to a lid (12), a bimetallic spiral thermometer (27) located in the housing for actuating a temperature indicator borne on a rotating rig (29, 30) mounted on a pivot of said housing, and at least one permanent magnet (38) capable of moving in the housing (11) according to the angular position of the rotating rig (29,30), which position is dependent on the temperature measured by the thermometric element (27), characterized in that each permanent magnet (38)

is mechanically independent from the bimetallic spiral thermometer (27) and is capable of radial displacement in the housing (11) according to the angular position of the rotating rig, (29, 30) which position is dependent on the temperature measured by the thermometric element (27), in that it comprises at least one sonic detecting-warning device (44), which is actuated by the radial displacement of said magnet (38), in that it comprises a power source (45), a sound emitting device (46) and an electrical interrupter (43) mounted in the same



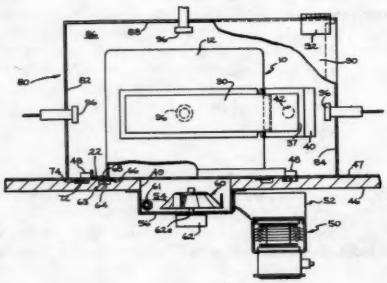
circuit as the power source (45) and the sound emitting device (46), said interrupter comprising a mobile blade made of a ferro-magnetic material actuated by the magnet (38) when said magnet is located at a preselected radial distance from said blade, and in that the sonic detecting-warning device (44) is provided with means for adapting it on the periphery of the housing (11) in such a manner that the sonic detecting-warning device (44) will emit a sound signal when the magnet (38) is located at least temporarily at a preselected distance from said device.

4,571,581

APPARATUS AND METHOD FOR PRODUCTION LINE LEAKAGE TESTING OF MICROWAVE OVEN CAVITIES

Peter H. Smith, Anchorage, and Raymond L. Dills, Louisville, both of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 5, 1984, Ser. No. 586,507
Int. Cl.[4] G08B *17/12*
U.S. Cl. 340—600 **17 Claims**



1. Apparatus for production line microwave leakage testing of a microwave oven cavity of the type having one wall defining an access opening for the cavity, said apparatus comprising:

a generally planar conductive test plate defining on one surface thereof a test position for supporting a microwave oven cavity to be leakage tested, said plate having an aperture formed therein, said cavity when positioned in said test position having its access opening facing said plate, overlaying said aperture with said one wall in microwave sealing engagement with said plate;

means for generating microwave energy;

means for coupling microwave energy from said generating means into the interior of said cooking cavity through said aperture and said access opening;

an enclosure comprising conductive walls for shieldably enclosing a cavity when in said test position on said plate;

microwave leakage detection means strategically disposed to detect the power density of microwave energy in the region between the cavity and the enclosure walls;

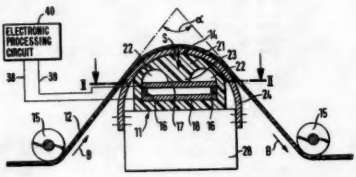
means responsive to said detection means operative to generate a user discernible signal upon detection of microwave power density greater than a predetermined reference level thereby alerting the user to the presence of flaws in the cavity permitting microwave leakage in excess of an acceptable level.

4,571,582

FAULT PRE-WARNING DEVICE FOR USE IN CARPET MANUFACTURING MACHINES

Arthur Walter, Waldkirch, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 17, 1983, Ser. No. 505,158
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1982, 3223054
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—677 **13 Claims**



1. In fault pre-warning apparatus for textile manufacturing machines of the kind in which a plurality of threads are led alongside one another past a switching strip to a production position for the production of a textile web; in which said switching strip comprises an elongate hollow elastic section having a longitudinal axis, an elongate hollow cavity, and first and second contact bands positioned spaced apart and confronting one another in said hollow cavity within said hollow section to initiate at least one of a warning signal and a stop signal when contact is established between said first and second contact bands as a result of the tension in one or more of said threads exceeding a predetermined tension, the improvement wherein said switching strip has an elongate curved guide surface and a rib extending from said guide surface inwardly into said hollow cavity into contact with said first contact band, and wherein said filaments pass directly over said guide surface substantially perpendicular to the longitudinal axis thereof and are wrapped around said guide surface over a predetermined angle.

4,571,583

BARKING DOG SIMULATED ALARM SYSTEM

Salvatore J. Giordano, 3112 Wilkinson Ave., Bronx, N.Y. 10461

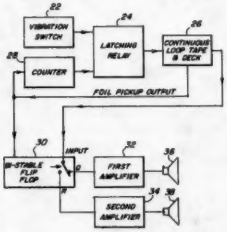
Filed May 2, 1984, Ser. No. 606,283
Int. Cl.[4] G08B *15/00*
U.S. Cl. 340—692 **3 Claims**

1. A barking dog simulated alarm system, comprising in combination:

(a) a vibration switch with contacts that momentarily close when the portal to which said switch is attached is made to vibrate;

(b) a latching relay which is activated by the closure of said contacts on said vibration switch;

(c) a continuous loop tape on which is recorded a menacing audio sound signal;
(d) a tape deck which is activated by the closure of said contacts on said latching relay in order to reproduce from said type said menacing audio sound signal;
(e) at least two loudspeakers;



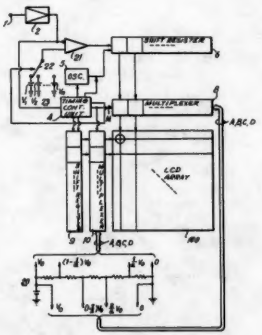
(f) means for shutting off said tape deck after a pre-determined number of cycles of said continuous loop tape; and,
(g) means for switching said audio signal from one to another of said speakers at the end of each of said cycles of said continuous loop tape in order to create the illusion of a moving threat such as a moving dog.

4,571,584

LIQUID CRYSTAL IMAGE DISPLAY SYSTEM

Yoshio Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,257
Claims priority, application Japan, Jul. 22, 1982, 57-127997
Int. Cl.[4] G09G *3/36, 3/00*
U.S. Cl. 340—784 **20 Claims**



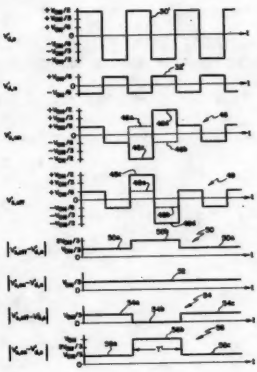
1. A liquid crystal image display apparatus, having a liquid crystal display array with a plurality of horizontal and vertical electrodes at respective sides of the array and forming a plurality of picture elements at each electrode intersection, for displaying an image represented by a video signal including an information portion, and a synchronizing portion comprising:
comparator means, connected to receive said video signal and a reference level signal, for producing an output signal based on a comparison therebetween;
reference signal generating means for generating said reference level signal having a plurality of selected reference levels that change in response to a selected number of consecutive fields of said video signal, said reference level signals being fed to said comparator means;
means for generating first drive signals derived from said output signals of said comparator means, which are fed to said vertical electrodes for driving said liquid crystal display array; and
means for generating second drive signals, derived from said synchronizing portion of said video signal, which are fed to said horizontal electrodes for driving said liquid crystal display array.

4,571,585

MATRIX ADDRESSING OF CHOLESTERIC LIQUID CRYSTAL DISPLAY

Charles R. Stein, Schenectady, and John E. Bigelow, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 17, 1983, Ser. No. 476,076
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 **33 Claims**



1. A method for addressing a multiplexible cholesteric-nematic liquid crystal display, comprising the steps of:
(a) defining each of a matrix of display cells by the intersection of one of a first plurality of data electrodes extended in a first direction and one of a second plurality of scan electrodes extended in a second direction different from said first direction, each cell requiring a signal of a first potential with at least a known magnitude V_{on}, between the associated data and scan electrodes defining that cell, to place said cell in a first optical condition;
(b) maintaining the signal on each of the second plurality of scan electrodes at a substantially zero amplitude, with respect to a common electrode reference potential, except when a particular one of said scan electrodes is active;
(c) providing first and second cyclic data electrode signals of substantially the same waveshape and peak amplitude determined solely by the known magnitude V_{on}, with respect to said common reference potential, and with substantially opposite phase;
(d) individually connecting a selected one of the first and second oppositely-phased signals to each individual data electrode along a line of cells, defined by that single active scan electrode anywhere in the matrix and then receiving a non-zero amplitude signal, to condition each cell along that line to be respectively capable and incapable of a change of optical condition;
(e) sequentially activating each of the entire second plurality of scan electrodes with a first scan signal having a predetermined number of cycles of the same waveshape as the data electrode signals and also having a selected one of a pair of selected combinations of one of first and second peak amplitudes, each based solely on said known signal magnitude V_{on} and independent of the number of lines being activated in any sequence, and one of first and second phases, to drive to the first optical condition all of

the cells receiving both the first scan signal and the data electrode signal defining a change-capable condition;

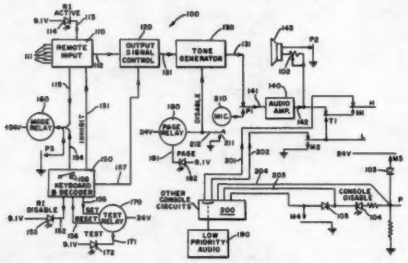
(f) then sequentially activating each of the entire second plurality of scan electrodes with a second scan signal, also having the data electrode signal waveshape for said predetermined number of cycles and having the combination of the remaining one of the first and second peak amplitudes and the remaining one of the first and second phases, to drive to a second optical condition, opposite to the first optical condition, all of the cells receiving both the second scan signal and the data electrode signal defining a change-capable condition; and

(g) maintaining in a previous optical condition the remaining matrix cells receiving the change-incapable signal and not being activated by either of steps (e) or (f).

4,571,586
ALARM CONSOLE CONTROLS

Robert W. Right, Huntington, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 6, 1983, Ser. No. 501,226
Int. Cl.[4] H04Q *1/00*; G08B *29/00*
U.S. Cl. 340—825.51 **16 Claims**



1. A priority alarm, paging and signalling system arranged in a predetermined hierarchy with each level of alarm paging and signalling causing termination of any lower priority alarm paging and signalling signal, said system comprising in cooperative combination:

(a) a console control station including a three wire output that may be used to control a plurality of remote sound generating and reproducing stations, and an alarm tone generator for selectively generating any one of a plurality of tone signals:

(b) a remote input unit having a plurality of input control leads and with said coupled to the output of a remote control unit the output of said remote input unit is coupled to the input of said tone generator for activating said tone generator to generate a selective one of said plurality of tone signals in response to a signal on a corresponding selected one of said plurality of input control leads;

(c) a keyboard control unit coupled to said tone generator unit for activating said tone generator to generate a unique one of said plurality of tone signals in response to activation of a corresponding unique key of said keyboard control unit;

(d) disable means coupled between said keyboard control unit and said remote control unit to give one of said keyboard or remote control units priority over the other when both are simultaneously activated;

(e) voice paging means;

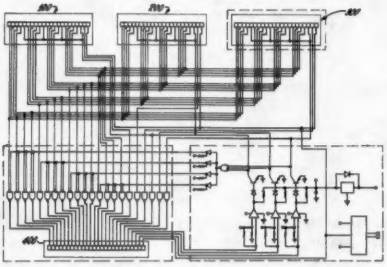
(f) an audio amplifier; and

(g) first coupling means for selectively coupling said voice paging means or said alarm tone generator to said audio amplifier.

4,571,587
DIGITAL INTERFACE SELECTOR

James M. Higginbotham, Jr., Newark; Eugene C. Varasso, Heath; Kenneth L. Rapp, Granville, and Thomas H. Sunkle, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 28, 1982, Ser. No. 402,680
Int. Cl.[4] H04Q *11/00*; G08C *15/00*
U.S. Cl. 340—825.53 **9 Claims**

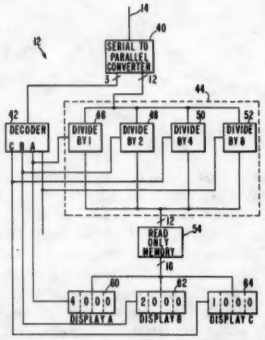


1. A digital interface selector for connecting a plurality of field digital devices to a digital receiving device comprising: a means for the digital receiving device to select a particular field digital device to transmit data; a means to interconnect all field digital devices; a means to verify that only one field digital device is transmitting data; software means associated with the digital receiving device to determine if the digital field device is transmitting valid data and a means to gate the valid data from the field digital devices to the digital receiving device.

4,571,588
SCALING CIRCUIT FOR REMOTE MEASUREMENT SYSTEM

Jenson K. S. Lee, Allston, and Mahasukh Vora, Beverly, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 23, 1983, Ser. No. 497,291
Int. Cl.[4] G08C *15/08*
U.S. Cl. 340—870.13 **10 Claims**



5. Apparatus for displaying the values of a plurality of measured parameters comprising:

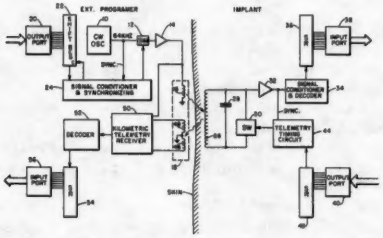
register means for temporary storage of a data word representing one of said parameters, said data word including a parameter identifier and parameter data;

decoder means responsive to said parameter identifier for determining a scale factor associated with said data word;
binary divider means for dividing said parameter data by said scale factor to provide scaled parameter data;
display means for display of said measured parameters;
data storage means for providing parameter values to said display means in response to said scaled parameter data,
whereby parameters having different ranges of values can be displayed and said data storage means is required to store only one set of parameter values.

4,571,589
BIOMEDICAL IMPLANT WITH HIGH SPEED, LOW POWER TWO-WAY TELEMETRY

Chester D. Slocum, and John R. Batty, Jr., both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Nov. 22, 1982, Ser. No. 443,446
Int. Cl.⁴ G08C *19/06;* A61N *1/00*
U.S. Cl. 340—870.32 **18 Claims**

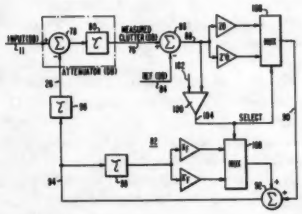


18. A two-way telemetry system for a biomedical implant, comprising
an external communications module having oscillator means for producing a continuous wave carrier signal at a constant frequency,
transmitter coil means,
gate means responsive to the output of the said oscillator means for producing a sync signal indicative of approximately the same point in successive cycles of carrier signal, and
modulator means responsive to said sync signal for producing said control signal in one condition to said gate means for a predetermined number of cycles of carrier in response to a data input in one condition and for producing said control signal in a separate condition for a second predetermined number of cycles of carrier signal in response to a data input of a second condition whereby pulsewidth, cycle synchronized modulated bursts of carrier signals are transmitted,
said external communications module further including pickup coil means, and means responsive to the output of said pickup coil means for producing an output indicative of relative phase shift of the output of said pickup coil means, and decoding means for recovering data from the output of said first detector means, and
an implantable enclosure,
a communications module mounted within said enclosure, including a telemetry coil tuned to said carrier frequency, a low impedance shunt circuit connected across said tuned coil including semiconductor means for modulating the impedance of said shunt circuit in accordance with a digital information signal to alter the phase and amplitude of a signal reradiated by said tuned coil in the presence of said carrier signal, second detector means coupled to said telemetry coil for producing a signal indicative of approximately the same point in each cycle of said carrier signal, missing pulse detector means responsive to the output of said second detector means for recovering transmitted data modulating said carrier signal, data timing means for producing said information signal to said shunt circuit, responsive to the output of said second detector means, in one condition for a first predetermined number of cycles of said carrier in accordance with data in one condition and for producing the information signal in a second condition for a second predetermined number of cycles of said carrier signal when the data is in a second condition.

4,571,590
SYSTEM FOR ADAPTIVELY ADJUSTING RADAR RECEIVER ATTENUATION

R. James Bennett, Prince Georges, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1983, Ser. No. 513,210
Int. Cl.⁴ G01S *13/00*
U.S. Cl. 343—7 AG **6 Claims**



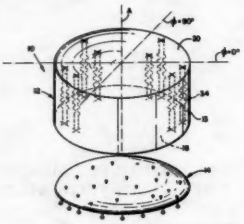
1. In a radar having receiver attenuation calibrated logarithmically, a system for adaptively adjusting the radar receiver attenuation of input signals having a wide dynamic range to maintain said attenuated signals within a predetermined range for radar post processing operations, said system comprising:
means for computing a logarithmic signal as a function of the clutter content of said input signals received over the time interval of a radar look;
an automatic gain control (AGC) loop governed by said computed logarithmic signal and a compatible reference logarithmic signal to generate a logarithmic adjustment signal for said receiver attenuation, said AGC loop comprising:
means for effecting an error signal for each look of a succession of radar looks, each error signal being representative of the difference between the logarithmic signal computed for the corresponding radar look and a compatible reference logarithmic signal;
means for gain adjusting each error signal with a respectively selected one of first and second loop gains to generate a succession of first signals appropriately delayed from their corresponding succession of radar looks; and
means for accumulating said generated first signals of said delayed succession, said accumulating means including means for adding each first signal to the previous accumulation of first signals gain adjusted with a selected one of third and fourth loop gains, said resulting accumulation of each first signal being the logarithmic adjustment signal for receiver attenuation for the next radar look of said succession of radar looks; and
means for selecting the loop gains of said AGC loop as a function of said computed logarithmic signal.

4,571,591

THREE DIMENSIONAL, ORTHOGONAL DELAY LINE BOOTLACE LENS ANTENNA

Pasquale A. Valentino, Glen Head; John J. Stangel, Mahopac, and Dwayne D. Donelin, Glen Oaks, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,336
Int. Cl.[4] H01Q 3/46
U.S. Cl. 343—754 9 Claims



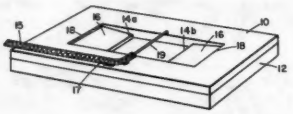
1. A bootlace microwave lens antenna comprising:
a constrained microwave lens body having first and second opposing surfaces, and a figure of revolution which is circularly symmetric about its principal axis;
concentric rings of dual polarized electromagnetic collector elements disposed about the principal axis on said first surface;
concentric rings of dual polarized electromagnetic radiator elements disposed about the principal axis on said second surface;
said collector and radiator elements including pairs of mutually orthogonal subelements each respectively aligned radially and tangentially in said concentric rings; and
a plurality of preselected lengths of electromagnetic conduit interconnecting respective ones of said collector elements with respective ones of said radiator elements.

4,571,592

SKIN EFFECT ANTENNAS

Raymond Justice, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed Mar. 3, 1983, Ser. No. 471,771
Int. Cl.[4] H01Q 13/10
U.S. Cl. 343—767 3 Claims



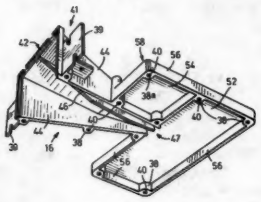
1. A microwave slot antenna comprising: a layer of conductive material having a slotted opening therethrough; said slotted opening having a length equal to one-half the wavelength of a first microwave frequency;
the conductive material on opposite end-sides of said slotted opening having a thickness equal to the skin depth of the conductive material at said first microwave frequency;
the thickness of said conductive material increasing outwardly from said slotted opening such that at a second microwave frequency separation distance symmetrical to said slotted opening of one-half the wavelength of said second microwave frequency, said thickness is equal to the skin depth of the conductive material at said second microwave frequency; so that said antenna resonates at said first and second frequencies.

4,571,593

HORN ANTENNA AND MIXER CONSTRUCTION FOR MICROWAVE RADAR DETECTORS

Glen D. Martinson, Oakville, Canada, assignor to B.E.L.-Tronics Limited, Mississauga, Canada

Filed May 3, 1984, Ser. No. 606,895
Int. Cl.[4] H01Q 13/02
U.S. Cl. 343—783 14 Claims



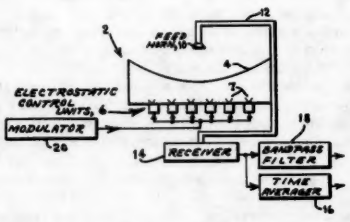
1. A horn antenna construction for use in microwave detection circuits, comprising:
a substantially rigid and planar mounting board having upper and lower surfaces;
a microstrip board on the upper surface of said mounting board, having at least one mixing diode and a feed strip therefor, where the feed strip is located at or near a first edge of the microstrip board and on the upper, exposed side thereof;
and a one-piece molded horn element having an open bottom, an upwardly flared top wall and a pair of side walls, and having a downwardly extending range formed on the underside of said top wall;
where said ridge extends rearwardly to the throat of said horn, and extends downwardly at least in said throat area to an extent that when said one-piece molded horn element is secured to the upper side of said mounting board, the bottom edge of said ridge in said throat area is brought into physical and electrical contact with said feed strip, and the upper surface of said mounting board forms the bottom wall of the horn.

4,571,594

DIRECTIONAL ANTENNA SYSTEM HAVING SIDELOBE SUPPRESSION

Randy L. Haupt, Stow, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 2, 1983, Ser. No. 529,078
Int. Cl.[4] H01Q 19/12; G01S 3/16, 3/28
U.S. Cl. 343—840 6 Claims



1. A directional antenna system comprising:
a reflector element having a flexible metallic membrane adapted for deployment in outer space,
a feed horn positioned in front of said reflector element

adapted to receive radiant energy reflected from said membrane,

electrostatic control means positioned behind said metallic membrane adapted to provide electrostatic forces upon said membrane whereby said membrane is shaped to focus said radiant energy at said feed horn,

signal processing means coupled to said feed horn for processing said radiant energy, and

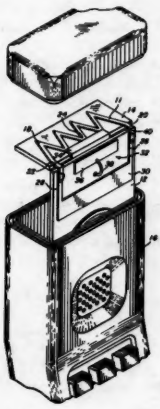
means for modulating said electrostatic control means to vibrate only discrete portions of said reflector element whereby the direction and shape of the main lobe of said reflector are unaffected while sidelobes of radiant energy are suppressed.

4,571,595

DUAL BAND TRANSCEIVER ANTENNA

James P. Phillips, Lake in the Hills, and Henry L. Kazecki, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1983, Ser. No. 558,270
Int. Cl.[4] H01Q *9/16, 1/24*
U.S. Cl. 343—745 **7 Claims**



1. A dual band transmission line antenna for a radio wave transceiver comprising:

a center portion of a fixed predetermined length for carrying an electrical signal, said center portion providing an inductive load and having first and second ends spaced apart;

a feed point located substantially central to said first and second ends of said center portion;

first and second radiator elements connected to said first and second ends respectively of said center portion:

a ground plane terminating said first and second radiator elements;

an adjustable impedance matching circuit coupled to said central feed point for balancing said antenna, and including a variable capacitor;

dual banding means for providing two frequency bands, and including a high Q circuit, parallel tuned at substantially the geometric mean of the center frequencies of the two bands, said dual banding means coupled to said impedance matching circuit; and

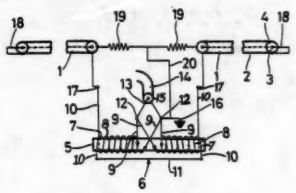
input/output means coupled to said dual banding means.

4,571,596

ANTENNA MATCHING DEVICE

Alec J. Hodgkinson, Johannesburg, South Africa, assignor to Z.S. Electroniques (Proprietary) Limited, South Africa

Filed Jun. 1, 1982, Ser. No. 384,112
Int. Cl.[4] H01Q *1/50*
U.S. Cl. 343—860 **4 Claims**



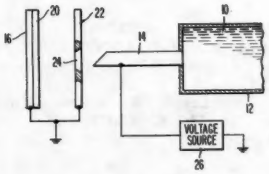
1. An antenna matching device comprising a ferromagnetic core having a balanced shape and composition to each side of a centre-tap position, each side having first and second parallel wound coils therearound, the coils of one side being wound in the same direction from the centre-tape position as the coils of the other side, each coil having a centre-tap lead and a free end lead remote therefrom, the free end leads of the first coils being connected together to form a short circuit therebetween, the centre-tap lead of each first coil of each side being connected to the centre-tap lead of the second coil of the other side to form respective radio unit feed terminals, one of which terminals is directly connected to earth; a pair of separate antenna leads connected to respective antenna terminals, the free end lead of each second coil being connected to its own antenna terminal; and resistor means connecting the earthed feed terminal to each separate antenna lead.

4,571,597

ELECTROSTATIC INK JET SYSTEM WITH POTENTIAL BARRIER APERTURE

Raymond H. Kocot, Danbury, Conn., assignor to Burroughs Corp., Detroit, Mich.

Continuation of Ser. No. 487,268, Apr. 21, 1983, abandoned.
This application Mar. 4, 1985, Ser. No. 707,524
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **32 Claims**



1. An ink jet printing system comprising:

an ink jet nozzle coupled to a reservoir containing a liquid imaging material, said reservoir for supplying said nozzle with said liquid imaging material;

a conductive platen positioned in spaced relation to said ink jet nozzle;

a recording member interposed between said platen and said ink jet nozzle;

potential difference means, connected between said ink jet nozzle and said platen, for applying a high voltage potential difference between said ink jet nozzle and said platen to thereby create an electric field sufficient to generate a jet of said liquid imaging material from said ink jet nozzle; and

potential barrier means, positioned in spaced rlation between

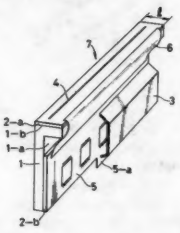
said recording member and said ink jet nozzle, for blocking charges built up on said recording member from influencing the electric field.

4,571,598

THERMAL HEAD

Michio Shinozaki, and Kaneki Yoshida, both of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Feb. 6, 1984, Ser. No. 577,049
Claims priority, application Japan, Feb. 8, 1983, 58-19162
Int. Cl.[4] B41J *3/20*
U.S. Cl. 346—76 PH **10 Claims**



1. A thermal print head for use with a thermal printer, comprising:

heat sink means having first and second portions;

a first substrate mounted on said first portion of said heat sink means and extending longitudinally a predetermined distance at least substantially equal to the width of a material to be printed, said first substrate defining a first plane;

a plurality of linearly arranged heating elements extending longitudinally across said first substrate so as to have a length substantially equal to said predetermined distance;

a second substrate physically distinct from said first substrate and mounted on said second portion of said heat sink means, said second substrate defining a second plane and being mounted with respect to said first substrate such that said second plane extends in a direction substantially parallel to said linearly arranged plurality of heating elements and forms an angle with said first plane in the range of from about 60 to 120 degrees; and

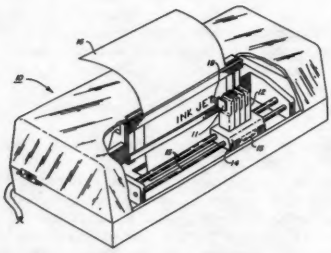
a control circuit mounted on said second substrate for controlling said plurality of heating elements.

4,571,599

INK CARTRIDGE FOR AN INK JET PRINTER

Ivan Rezanka, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1984, Ser. No. 677,426
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **13 Claims**



1. An improved ink cartridge for use in an ink jet printer of the type having a reciprocating carriage adapted to receive at least one ink supply cartridge with integrally mounted thermal printheads forming a part thereof, means for stepping a recording medium a predetermined, fixed distance after each traversal of the carriage across the width of the recording medium, and means for propelling ink droplets from the nozzles of each printhead on demand in response to digitized data signals, wherein the improved ink cartridge comprises:

an upper end portion having a thermal printhead fixedly mounted thereon, a self-contained supply of ink, and a lower end portion adapted for mounting upon said carriage;

said printhead having an internal chamber communicating with each of one end of a linear array of internal, parallel channels which are aligned perpendicular to the carriage reciprocating direction, the other end of the channels terminating in a nozzle that is spaced from and confronts the recording medium when installed on the carriage, the chamber having an opening for ingress of ink, and each channel having an individually addressable resistor at the nozzle for the thermal expulsion of ink droplets in response to the passage of current pulses therethrough;

means for addressing the resistors with current pulses representative of said data signals;

the supply of ink being hermetically sealed in the cartridge under a predetermined negative pressure, an elongated, internal passageway extending from the lower end portion of the cartridge to the upper end portion, the passageway having an aperture in the cartridge upper end portion for supplying ink to the printhead channels via the chamber and the chamber opening which is in communicating alignment with the passageway aperture, the opposite end of the passageway at the cartridge lower end portion having an entrance gap of predetermined dimensions; and

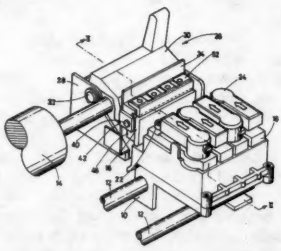
a secondary reservoir located in the lower end portion of the cartridge for containing an air pocket of dust-free air at atmospheric pressure, said secondary reservoir being adapted to release air into the cartridge to maintain the predetermined negative pressure therein as the ink supply is depleted, the negative ink pressure at the printhead nozzles being maintained by the difference in height between the ink supply in the cartridge and the passageway entrance gap.

4,571,600

NOZZLE BLOCKAGE PREVENTING UNIT IN AN INK JET SYSTEM PRINTER

Takafumi Hara, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1983, Ser. No. 543,539
Claims priority, application Japan, Nov. 4, 1982, 57-194146
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **3 Claims**



3. A combination comprising:

an ink jet nozzle having an orifice for emitting droplets;

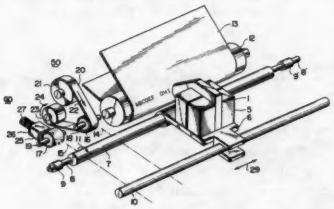
cover means for sealingly engaging said nozzle for defining a fluid-tight chamber surrounding said orifice;
orifice protection liquid in said chamber in contact with said orifice;
opening means in said cover means for introducing said liquid into said chamber when said cover means is sealingly engaged with said nozzle;
closure means for said opening for maintaining said liquid in said chamber; and
means for directing said orifice protection liquid in said chamber away from said printer head when said cover means is disengaged from said nozzle.

4,571,601

INK JET PRINTER HAVING AN ECCENTRIC HEAD GUIDE SHAFT FOR CLEANING AND SEALING NOZZLE SURFACE

Shoichi Teshima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 29, 1985, Ser. No. 695,901
Claims priority, application Japan, Feb. 3, 1984, 59-19123
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **6 Claims**



1. An ink jet printer comprising:
an eccentric guide shaft;
an ink writing head having a nozzle surface, the writing head being adapted to be reciprocably moved along said guide shaft to scan a print line during print mode and moved to a cleaning position outside said print line during non-print mode;
nozzle cleaning means located adjacent said cleaning position for movably supporting a liquid-absorbing cleaning tape along a path parallel to and adjacent to said nozzle surface; and
drive means for rotating said guide shaft about the eccentric axis thereof and moving said tape along said path during said non-print mode so that said nozzle surface moves in a substantially circular path to permit a section of said tape to provide a wiping action over said nozzle surface.

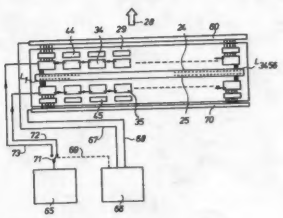
4,571,602

RECORDING APPARATUS

Lucien A. De Schamphelaere, Edegem; Freddy M. Librecht, Boechout; Willy F. Van Peteghem, Berchem, and Etienne M. De Cock, Edegem, all of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 26, 1984, Ser. No. 665,542
Claims priority, application Belgium, Nov. 1, 1983, 83201562
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—160 **7 Claims**

1. A recording apparatus for linewise recording information on a moving photoreceptor, said apparatus comprising a recording head with a multiplicity of individually addressable and energisable point-like radiation sources arranged in staggered parallel rows for irradiating points across a photoreceptor during movement thereof relative to and in a direction normal to said rows and driver circuits for simultaneously energising the radiation sources of each row responsive to respective data-bit input signals serially applied to said driver circuits during an information line period, there being delay means for delaying energisation of the radiation sources of a first said row relative to the energisation of the sources of a second said row thereby to compensate for the distance between such rows, characterised in that the driver circuits for the different rows of radiation sources are provided by identical chips each of which incorporates a shift register for serially reading in data-bit signals, said drivers for said plurality of the radiation sources and said delay means located between said shift register and said drivers for holding data-bit signals transferred from said shift register for a delay period before such signals are transmitted to said drivers; each said chip is formed so that it is capable of operating in different modes in one of which said delay means is operative and in the other of which such delay means is inoperative and the mode in which it operates depends on which of different voltage input points provided on each said chip being selected for the reception of a mode control voltage; and only the chips providing the driver circuits for the radiation sources requiring the delayed energisation are connected into said mode control voltage so as to operate in the delay-operative mode.



4,571,603

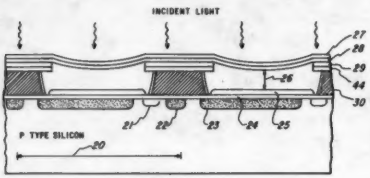
DEFORMABLE MIRROR ELECTROSTATIC PRINTER

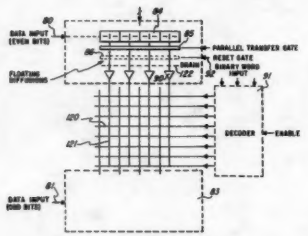
Larry J. Hornbeck, Van Alstyne; William E. Nelson, Dallas, and James T. Carlo, Missouri City, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 317,717, Nov. 3, 1981. This application Jan. 10, 1984, Ser. No. 568,938
The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 **14 Claims**

7. A printer system comprising:
input means to produce electrical signals in response to an image to be printed;
a serial-to-parallel register to receive said electrical signals;
a plurality of light modulator means connected in parallel to said serial-to-parallel register, said modulator means to

selectively deflect external light in response to data from said serial-to-parallel shift register;





optical means to produce a projected image from said selected light; and

printing means to print said projected image upon a surface.

4,571,604

METHOD OF AND DEVICE FOR THE ELECTROPHOTOGRAPHIC PRINTING OF INFORMATION

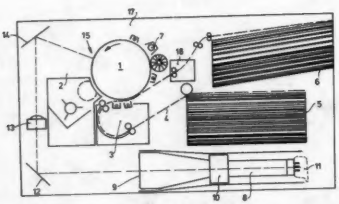
Ulrich Schiebel, Aachen-Brand, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 354,426, Mar. 3, 1982, abandoned. This application Aug. 21, 1984, Ser. No. 642,973

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108115

Int. Cl.[4] G01D *15/14*; H04N *1/30*

U.S. Cl. 346—161 **7 Claims**



1. A method of electrophotographic printing of electrically stored information, comprising:

line-sequentially scanning a luminescent layer of a cathode ray tube by means of a cathode beam of the tube which beam is controlled in accordance with stored information;

forming a line of a mosaic-like latent charge image on a photoconductive layer of a first moving record carrier, said forming step including optically coupling the activated luminescent layer of the tube with the record carrier;

developing the formed image, and

transferring the developed image to a second moving record carrier, said line-sequentially scanning step further including the cathode beam scaning the same line on the luminescent layer a number of times successively with the same information and with a line frequency which is greater than a minimum line frequency corresponding to a quotient determined by the speed of the first carrier and the line interval between two consecutive lines to be formed on the first carrier, said forming step further including the first record carrier moving continuously during said line-sequentially scanning step.

4,571,605

THERMOSENSITIVE RECORDING MATERIAL

Takanori Motosugi, and Hisashi Sakai, both of Numazu, Japan, assignors to Ricoh Company, Ltd, Tokyo, Japan

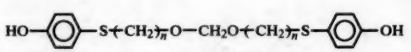
Filed Nov. 9, 1984, Ser. No. 669,890

Claims priority, application Japan, Dec. 6, 1983, 58-230243

Int. Cl.[4] B41M *5/22*

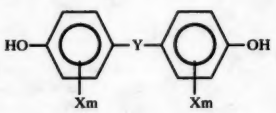
U.S. Cl. 346—216 **5 Claims**

1. In a thermosensitive recording material comprising a support material and a thermosensitive color-forming layer formed on said support material, said thermosensitive color-forming layer comprising a colorless or light-colored leuco dye and a color developer capable of inducing color formation in leuco dye upon application of heat thereto, the improvement wherein said color developer is 4-hydroxydimethylphthalate or a first bisphenol derivative of the formula (I),



(I)

wherein n is an integer of 1 or 2, and there is interposed between said support material and said thermosensitive color-forming layer an under-coated layer comprising a second bisphenol derivative of the formula (II),



(II)

wherein X represents halogen, Y represents —SO_2— or —

,

m is an integer of 1 or 2, and the substitution positions of Xm in the benzene rings are symmetrical with respect to Y.

4,571,606

HIGH DENSITY, HIGH VOLTAGE POWER FET

James A. Benjamin, Waukesha, Wis.; Robert W. Lade, Fort Myers, Fla.; Herman P. Schutten, Milwaukee, and Stanley V. Jaskolski, Sussex, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,484

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **5 Claims**

1. High density, high voltage lateral FET structure, comprising:

a source region of one conductivity type semiconductor material;

a channel region of opposite conductivity type semiconductor material forming a junction with said source region;

a drift region of said one conductivity type semiconductor material forming another junction with said channel region;

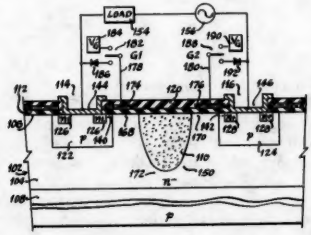
first circuit connection means communicating with said source region;

second circuit connection means communicating with said drift region;

an insulative region in said drift region between said channel region and said second circuit connection means;

gate means disposed proximate said channel region and adapted for application of an electrical potential for producing an electric field of sufficient intensity to invert the conductivity type in said channel region;

whereby upon application of voltage across said first and second circuit connection means, electric current can flow therebetween under control of said electrical potential of said gate means, and such that in the absence of said electrical gate potential, said insulative region prevents in-



duced conductive channel inversion through said drift region, to enhance OFF state voltage blocking capability;

wherein each of said regions is disposed along a top major surface of a semiconductor substrate, and wherein said insulative region extends downwardly from said top major surface to divert conductive current paths thereabout between said channel region and said second circuit connection means, whereby to lengthen the drift region conductive path, so as to sustain higher blocking voltage, without increasing the lateral dimension along said top major surface;

wherein said insulative region comprises porous silicon filled with oxide to substantially reduce the conductivity therethrough and effectively divert conduction paths thereabout.

4,571,607

SEMICONDUCTOR DEVICE

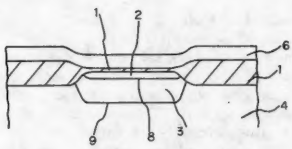
Ryoiku Togei, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 220,969, Dec. 29, 1980. This application Jan. 26, 1984, Ser. No. 573,601

Claims priority, application Japan, Dec. 27, 1979, 54-170782

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.6 **22 Claims**



1. A semiconductor device for connection to a sensing circuit, comprising:

a substrate of material selected from the group of an insulator and a semiconductor having one conductivity type,

a semiconductor charge source region having a conductivity type different from that of said semiconductor substrate and being formed on a selected portion of said substrate that said substrate defines a boundary of said charge source region,

a semiconductor charge storage region having a conductivity type different from that of said charge source region and being formed on a selected portion of said charge source region and isolated from said substrate by said charge source region,

a first insulating layer formed on said charge storage region,

a second insulating layer formed on a portion of and defining a boundary of said charge source region and formed on said substrate such that said second insulating layer is thicker than said first insulating layer, and

a conductor layer formed to cover at least said first insulating layer and operatively connectable to the sensing circuit, whereby said semiconductor device functions as a memory cell.

4,571,608

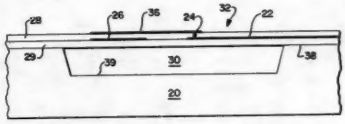
INTEGRATED VOLTAGE-ISOLATION POWER SUPPLY

Robert G. Johnson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 3, 1983, Ser. No. 455,147

Int. Cl.⁴ H01L *23/56*

U.S. Cl. 357—28 **30 Claims**



1. An integrated voltage-isolation power supply, comprising:

a thin film heater;

a thin film thermocouple, the thermocouple comprising a hot junction and a cold junction;

a thin film of dielectric; and

a semiconductor body for supporting a portion of the thin film of dielectric out of contact with the body, the thin film of dielectric out of contact with the body supporting the heater and the hot junction of the thermocouple, the hot junction being disposed adjacent to the heater but out of electrical contact with the heater, the cold junction being substantially heat sunk to the semiconductor body.

4,571,609

STACKED MOS DEVICE WITH MEANS TO PREVENT SUBSTRATE FLOATING

Hiroshi Hatano, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 271,116, Jun. 8, 1981. This application Apr. 3, 1984, Ser. No. 596,561

Claims priority, application Japan, Jun. 16, 1980, 55-80159

Int. Cl.⁴ H01L *27/02*

U.S. Cl. 357—41 **1 Claim**

1. An MOS type semiconductor device comprising:

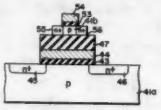
a. a semiconductor substrate of a first conducting type;

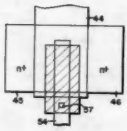
b. a first MOS transistor formed on a portion of said semiconductor substrate;

c. an insulating layer formed on said first MOS transistor and on a portion of said substrate, said insulating layer having an opening to said substrate; and

d. a second MOS transistor formed on said insulating layer at least in part over said first MOS transistor, said second MOS transistor comprising a source region of a second conductivity type completely separated from said substrate by said insulating layer, a drain region of said second conductivity type spaced from said source region and

completely separated from said substrate by said insulating layer, and a channel region of said first conductivity





type located between said source and drain regions and over said opening in said insulating layer and contacting said substrate through said opening.

4,571,610

SEMICONDUCTOR DEVICE HAVING ELECTRICALLY INSULATING SUBSTRATE OF SIC

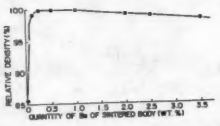
Yasuo Matsushita; Yukio Takeda; Kousuke Nakamura, all of Hitachi, and Tokio Ohkoshi, Toyohashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

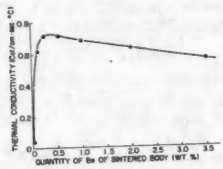
Continuation-in-part of Ser. No. 203,554, Nov. 5, 1980, Pat. No. 4,370,421. This application Dec. 16, 1982, Ser. No. 450,566

Claims priority, application Japan, Nov. 5, 1979, 54-142059; Jun. 6, 1980, 55-75601; European Pat. Off., Nov. 4, 1980, 8010679.9

Int. Cl.⁴ H01L *23/36, 23/14, 23/08, 23/54*

U.S. Cl. 357—67 **11 Claims**





1. A semiconductor device in which at least one semiconductor element is disposed on an electro-insulative silicon carbide sintered body of an electrical resistivity of 10^7 Ω-cm or more at 25° C. and of a linear thermal expansion coefficient of not larger than 4.0×10^{-6}, said sintered body having a relative density of not less than 90%.

4,571,611

SEMICONDUCTOR CHIP WITH A METAL HEAT RADIATOR

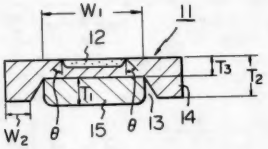
Shunji Kashiwagi, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1983, Ser. No. 480,588

Claims priority, application Japan, Mar. 31, 1982, 57-53124

Int. Cl.⁴ H01L *5/00, 3/00*

U.S. Cl. 357—81 **8 Claims**



1. A semiconductor chip, comprising:

a semiconductor substrate having a first surface with an active region formed therein and having a second surface opposite said first surface, with a recess formed therein in a region opposite from said active region, said recess having a bottom surface; and

a heat radiator plate bonded to said bottom surface of said recess in said second surface of said semiconductor substrate.

4,571,612

CORROSION-PROTECTED ELECTRICAL CIRCUIT COMPONENT

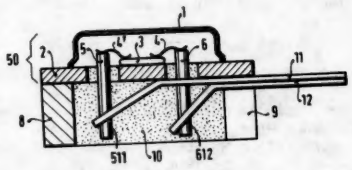
Manfred Frister, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 382,930, May 28, 1982. This application Jun. 16, 1983, Ser. No. 504,840

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228457

Int. Cl.⁴ H01L *23/02, 23/28*

U.S. Cl. 357—81 **20 Claims**



1. Corrosion-protected circuit component (**50**) and connection arrangement for forming a bond connection (**511, 612**) with a connection conductor (**11, 12**), said component (**50**) having

a housing (**1, 2**) including

a cup-shaped metal cap (**1**);

a metal base plate (**2**), said metal base plate and said cup-shaped metal cap being welded together, the base plate (**2**) forming a bottom plate of the semiconductor component;

a semiconductor body (**3**) secured to the bottom plate (**2**) of the housing interiorly thereof;

at least one terminal connection pin (**5, 6**) extending and sealed through the bottom plate of the housing, having an interior portion located within the housing and an exterior portion exteriorly projecting from the housing, the at least one pin being insulated from the housing and positioned inwardly of the marginal portions of the bottom plate, the exterior portion projecting from the bottom plate of the housing by a predetermined distance;

at least one bonding wire (**4, 4'**) located interiorly of the

housing and extending between at least one selected region of the semiconductor body (3) and the portion of the at least one connection pin within the housing;

and a protective tubular element (8) extending from the bottom wall of the housing in the direction of the exteriorly projecting portion of the at least one terminal connection pin for a distance which is at least as great as the projection distance of the at least one terminal connection pin to permit formation of a bond connection (511, 612) inwardly of the end of the at least one connection terminal pin and thereby bonding of the connection conductor (11, 12) to the at least one terminal connection pin in a position protected by the tubular element;

said tubular element (8) and the bottom plate (2) forming an open cup-shaped structure to permit introduction of an insulated corrosion-protective plastic compound (10) thereinto to embed and protect the bond connection (511, 612) of the connecting conductor (11, 12) and the at least one terminal connection pin (5, 6); and wherein the connection conductor (11, 12) is an integral conductor leading outside of the housing (1, 2); the bond connection (511, 612) directly connecting the connection pin (5, 6) to the connection conductor.

4,571,613

NOISE REDUCTION CIRCUIT FOR A VIDEO SIGNAL USING A FEEDBACK TYPE COMB FILTER AND AN EQUALIZER CIRCUIT

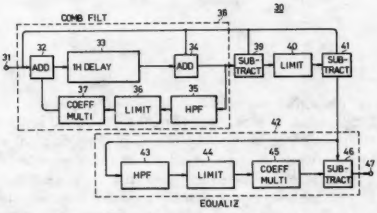
Hisatoshi Fukuda, Yokohama, Japan, assignor to Victor Company of Japan Ltd., Yokohama, Japan

Filed Dec. 3, 1984, Ser. No. 677,169

Claims priority, application Japan, Dec. 5, 1983, 58-229348

Int. Cl.⁴ H04N *9/64*

U.S. Cl. 358—36 **4 Claims**



1. A noise reduction circuit for a video signal, said noise reduction circuit comprising:

a feedback type comb filter in which an output video signal of a delay circuit which delays a video signal by one or two horizontal scanning periods, is fed back to an input side of said delay circuit through a feedback path, said feedback path comprising a highpass or bandpass filter circuit, a first limiter, and a first coefficient multiplier which are coupled in series; and

an equalizer circuit supplied with an output video signal of said feedback type comb filter, said equalizer circuit having a frequency characteristic approximately complementary to an envelope characteristic in a frequency characteristic of said feedback type comb filter.

4,571,614

COLOR IMAGE DISPLAY APPARATUS

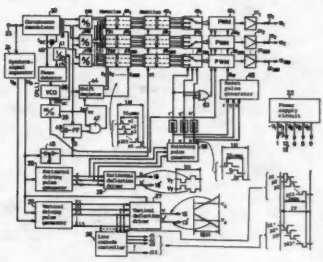
Sadahiro Iyehara, Suita; Shizuo Inohara, Toyonaka; Mitsuya Masuda; Minoru Ueda, both of Takatsuki, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 17, 1983, Ser. No. 495,433

Claims priority, application Japan, May 19, 1982, 57-85136; Apr. 30, 1983, 58-77028

Int. Cl.⁴ H04N *5/66*

U.S. Cl. 358—56 **5 Claims**



1. A color image display apparatus comprising:

clock signal generator means for generating a clock signal having a frequency of an integer-times-mulitplication of a color sub-carrier of a color television signal, said clock signal being synchronized to said color sub-carrier,

A/D conversion means for converting chrominance signals of said color television signal into digital chrominance signals by utilizing said clock signal,

memory means for storing said digital chrominance signals until the end of a next horizontal scanning period,

PWM means for converting said ditigal chrominance signals read out from said memory means into pulse-width modulated chrominance signals utilizing said clock signal, and

color image display means for displaying a color image by utilizing said pulse-width modulated chrominance signals.

4,571,615

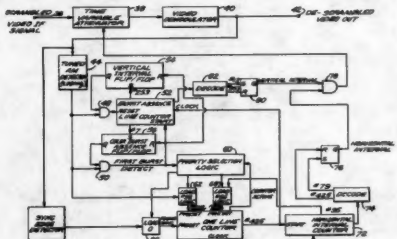
TIMING GENERATOR FOR SYNC SUPPRESSED TELEVISION SIGNALS

Clyde Robbins, Fort Washington, and Luis Morenilla, Warminster, both of Pa., assignors to General Instrument Corporation, New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,933

Int. Cl.⁴ H04N *7/167*

U.S. Cl. 358—120 **7 Claims**



1. A descrambling circuit for producing signals during the vertical and horizontal intervals of a sync-suppressed scrambled signal, said circuit comprising first means for detecting the absence of color burst for a preset duration, second means for

detecting the occurrence of a color burst signal following the absence of color burst for said preset duration, and first and second logic means respectively operatively coupled to and responsive to the operation of said first and second detecting means for respectively generating a reconstructed vertical interval signal and a horizontal interval signal.

4,571,616

DEVICE FOR DISPLAYING THREE-DIMENSIONAL IMAGES

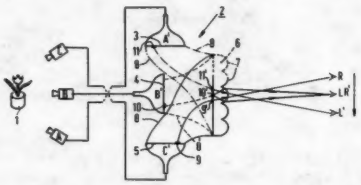
Jan Haisma, and Gijsbertus Bouwhuis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,221

Claims priority, application Netherlands, Jul. 21, 1982, 8202934

Int. Cl.⁴ H04N *9/58*

U.S. Cl. 358—88 **17 Claims**



1. A device for displaying three-dimensional images in which N recorded images corresponding to N various spatial observation positions are displayed on at least one intermediate display screen and in which corresponding picture segments of the recorded images are displayed through a lens element of a viewing screen, characterized in that the device further comprises an optical coupling disposed between the intermediate display screen and the viewing screen, the optical coupling including light conductors arranged such that the light conductors unambiguously associate a group of N corresponding picture segments with the lens element of the viewing screen.

4,571,617

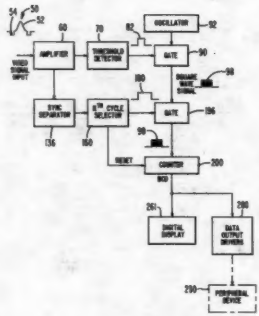
APPARATUS AND METHOD FOR MEASURING AND DISPLAYING THE PULSE WIDTH OF A VIDEO SIGNAL

Jacob P. Hasili, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 27, 1984, Ser. No. 574,460

Int. Cl.⁴ H04N *7/18*

U.S. Cl. 358—107 **7 Claims**



1. Apparatus for providing indications at a rate which can be visually perceived by a human observer of the measured durations of selected ones of data pulses interleaved in time with synchronizing pulses, which synchronizing pulses recur at a rate substantially higher than said rate of indication by a factor of n, n being a positive integer, said apparatus comprising:

a. an oscillator supplying oscillations at a constant prescribed rate substantially higher than the data pulse durations to be measured;

b. a counter for counting selected ones of said oscillations;

c. a sync separator for separating said synchronizing pulses from said data pulses;

d. N^{th} means for selecting every N^{th} cycle of a respective synchronizing pulse followed by a respective data pulse, the duration of which is to be measured;

e. a threshold detector for supplying indications of when the pulses, the durations of which are to be measured, exceed a threshold value;

f. means responsive to the synchronizing pulse in each selected N^{th} cycle for resetting said counter to zero count;

g. means responsive to said indication from said threshold detector for enabling said counter during each selected N^{th} cycle, to count said oscillations supplied to said counter from said oscillator; and

h. display means responsive to the final count in said counter for each selected N^{th} cycle to provide indications of said count to said human observer until the next selected N^{th} cycle.

4,571,618

TV SIGNAL MEDIAN PREDICTION CODING SYSTEM

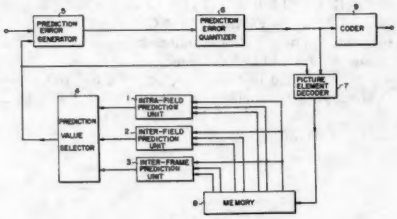
Yoshinori Hatori, Kawasaki; Hitomi Murakami, Yokohama, and Shuichi Matsumoto, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,356

Claims priority, application Japan, Aug. 27, 1981, 56-133279

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—136 **1 Claim**



1. In a TV signal median prediction coding system in which a prediction value of a picture element to be coded is obtained from information of an already coded picture element and a difference between the prediction value and the value of the picture element to be coded is coded, the improvement comprising; a storage section having a capacity large enough to store input TV signals of at least one frame at all times; an intrafield prediction section which, when supplied with a value X_1 of the latest input picture element of the TV signal, produces a prediction value $\overline{X}_{1N}$ of the latest input picture element using a value of a picture element of the same field as the latest input picture element, read out from the storage section; and an interfield prediction section which, when supplied with the value X_1 of the latest input picture element, produces a prediction value $\overline{X}_{1K}$ of the latest input picture element using a picture elements of the same field as the latest input picture element and the immediately preceding field, read out from the storage section; an interframe prediction section which, when supplied with the value X_1 of the latest input picture element produces a prediction value $\overline{X}_{1F}$ of the latest input picture element using picture elements of the same field as the latest input picture element, the immediately preceding frame; and an adaptive control section which compares the intrafield

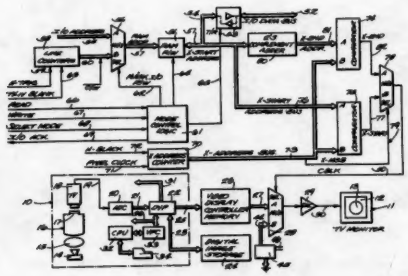
prediction value $\overline{X}_{1N}$, the interfield prediction value $\overline{X}_{1K}$ and the interframe prediction value $\overline{X}_{1F}$ in magnitude and selects a median value of the values compared as the latest input picture element value $\overline{X}_1$.

4,571,619

PROGRAMMABLE VIDEO MASK GENERATOR

Gerd Mewitz, New Berlin, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,294
Int. Cl.[4] H04N *5/14, 5/32;* **H05G** *1/64*
U.S. Cl. 358—160 **3 Claims**



1. For a system wherein an image is acquired with a raster scanned video system and an analog-to-digital converter (ADC) converts the analog video signals for each horizontal line at a pixel clock pulse rate to digital signals whose values represent the intensities of the picture elements (pixels) composing the image, and digital pixel data for an image frame are stored in a display memory to be accessed for driving a video monitor to write the image on its screen, and the image is symmetrical relative to a vertical center line of a raster scanned screen,

improved means for surrounding said image with a field of uniform selected intensity when the image is written on the screen, comprising:

a display control multiplexer having a first input coupled to said display memory for storing the digital pixel data composing the image and a second input coupled to a selectable pixel intensity source, and having an output coupled to said video monitor, said MUX responding to alternate select signal states coupled to its select input by gating the signals on one or the other of its inputs to its output,

a memory for storing digital x-start addresses of the respective pixels in each horizontal line at which writing of image data is to start,

first digital counter means incremented by one for each horizontal line in a raster, outputs of said counter constituting addresses to the memory and the memory responding to an address by outputting the x-start address for the corresponding horizontal line,

second digital counter means incremented by one for every pixel clock pulse, having count outputs constituting x-addresses of the pixels running from the first to the last pixel in a horizontal line,

first and second comparator means each having at least two inputs and an output,

bus means for coupling said x-addresses simultaneously to one input of each of said comparator means, said bus means including at least enough lines for conducting a digital x-address having a sufficient number of bits including a most significant bit to represent one-half of the total number of pixels in a horizontal line,

2's complement converter means having input means for said x-start addresses and having output means and operative to convert said x-start addresses to the equivalents of their negative values representative of pixel x-end addresses at the ends of the image in the horizontal scan lines in order to produce a symmetrical image,

multiplexing means having an output and one input coupled to said first comparator means output, said multiplexing means being in a state for switching a select signal of one state from the first comparator means output to said multiplexing means output until the x-address becomes greater than the x-start address applied to said first comparator, said select signal of one state causing said display control multiplexer to couple said source to said video monitor for writing the pixels of selected intensity, and when said x-start address and x-addresses compare, said first comparator means output changing on the next pixel x-address increment to a select signal of another state causing said display memory to be coupled to said video monitor so it writes image pixels,

said multiplexing means responding to the most significant bit of the x-addresses supplied to said first comparator means being set in correspondence with one-half of the pixels in a line being counted by coupling the other input of said multiplexing means to the output of the second comparator, whose select signal output state is such as to maintain writing of image data on the line,

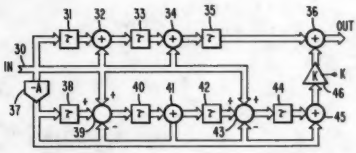
said second comparator continuing to compare the x-addresses, starting with the first one in the second half of the total pixel addresses with the x-end addresses, and when an x-address is greater than an x-end address, the output select signal from the second comparator changes to the state for causing said display control multiplexer to couple said selectable signal source again for said monitor to write pixels of selected intensity to the end of the horizontal line.

4,571,620

LUMINANCE PEAKING FILTER FOR USE IN DIGITAL VIDEO SIGNAL PROCESSING SYSTEMS

William D. Anderson, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 4, 1983, Ser. No. 549,489
Int. Cl.[4] H04N *5/14, 5/21*
U.S. Cl. 358—166 **10 Claims**



1. A digital peaking circuit for peaking a luminance component of a digital video signal comprising:

a source of digital luminance signals;

a first digital processing circuit having an input port coupled to said source, having an output port and characterized by having the transfer function $f1 = Z^{-1} + Z^{-2} + Z^{-3}$ where the Z's indicate conventional Z transform notation;

a second digital processing circuit having an input port coupled to said source, having an output port, and characterized by having the transfer function $f2 = -A + (-1 + A)Z^{-1} - AZ^{-2} + (1 + A)Z^{-3} - AZ^{-4}$ where A is a constant scale factor;

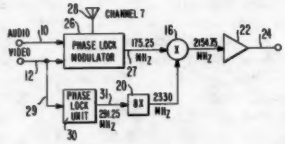
means connected to the output port of said second digital processing means for multiplying output samples produced thereby by a scale factor K; and

summing means coupled to the means for multiplying and the output port of said first digital processing means for combining signal samples produced by said respective means to produce a peaked luminance signal.

4,571,621
TELEVISION TRANSMITTER

Alfred A. Dalimonte, Westbury, N.Y., and Paul J. Fung, San Mateo, Calif., assignors to Microband Corporation of America, New York, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,705
Int. Cl.[4] H04N 5/38
U.S. Cl. 358—186 11 Claims

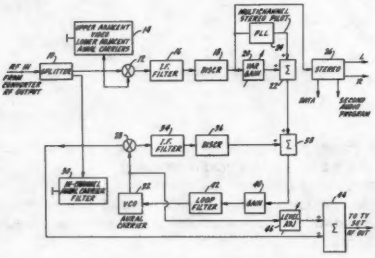


1. In a television transmitter including a television modulator for modulating an applied video signal; a local oscillator circuit for a generating local oscillation signal; and a converter for converting the local oscillation signal and the modulated video signal to provide a television transmission signal, the improvement in which the local oscillator circuit includes first receiving means for receiving a received video signal; a controlled oscillator applying said local oscillator signal to the converter for mixing with the modulated video signal; and control means coupled to said first receiving means and said controlled oscillator and responsive to a parameter of the received video signal for controlling the frequency of the local oscillation signal in accordance with said parameter of the received video signal to relate the frequency of the provided television transmission signal to said parameter.

4,571,622
HYBRID FREQUENCY MODULATION FEEDBACK LOOP REMOTE VOLUME CONTROL CIRCUIT

Mircho A. Davidov, and Michael L. Tentler, both of San Diego, Calif., assignors to Oak Industries Inc., Rancho Bernardo, Calif.

Filed May 25, 1984, Ser. No. 614,058
Int. Cl.[4] H04N 5/44, 5/00, 5/62, 5/60
U.S. Cl. 358—194.1 7 Claims

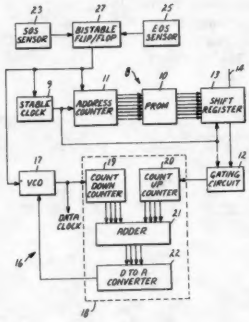


1. A hybrid TV frequency modulation feedback loop (FMFB) remote volume control includes an RF input including video and aural carriers with common mode spurious deviation (CMSD) thereon, an intercarrier audio detection circuit connected thereto and providing a baseband audio signal, means for varying the amplitude of said baseband audio signal, means connected to said input for using the video carrier to provide a signal representative of CMSD, and means for combining the CMSD signal, the amplitude controlled baseband audio signal and providing an aural carrier signal having CMSD and amplitude controlled audio.

4,571,623
DATA CLOCKING CIRCUITRY

David J. Schoon, North Branch, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1984, Ser. No. 574,066
Int. Cl.[4] H04N 3/08
U.S. Cl. 358—208 4 Claims



1. Data clocking circuitry for providing data clocking signals for use in the control of a laser to establish on-off operation of the laser with respect to a scan line defined by a scanning apparatus using a self-resonant mirror device to which the output of the laser is directed including:

a clock signal producing means for providing clock signals which are equally spaced by equal time intervals and selecting from such clock signals, clock signals that can be used for the production of data clocking signals so that on-off operation of the laser will occur when the laser is directed via the self-resonant mirror to predetermined points along a scan line;

data clocking signal producing means including a voltage controlled oscillator having an output at which data clocking signals are provided, and control signal means operatively connected to said voltage controlled oscillator for receiving said data clocking signals and to said clock signal producing means for receiving the selected clock signals, said control signal means providing an output control signal that is based on the difference in accumulated count between the selected clock signals and data clocking signals and is connected to said voltage controlled oscillator for control of said voltage control oscillator in accordance with said control signal.

4,571,624
TWO-DIMENSIONAL SOLID-STATE IMAGE SENSOR DEVICE

Junichi Nishizawa; Takashige Tamamushi, both of Sendai; Koji Shimanuki, and Masafumi Inuiya, both of Ashigarakami, all of Japan, assignors to Fuji Film Co., Tokyo and Junichi Nishizawa, Miyagi, both of, Japan

Filed Dec. 14, 1983, Ser. No. 561,444
Claims priority, application Japan, Dec. 14, 1982, 57-218931
Int. Cl.[4] H04N 3/12
U.S. Cl. 358—212 9 Claims

1. A two-dimensional solid-state image sensor device, comprising:

(a) a plurality of picture cells which are two-dimensionalally arranged in column and row directions;

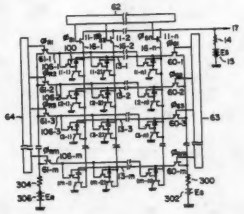
each picture cell comprising:

(a-1) a static induction transistor having first and second main electrode regions formed of semiconductor regions with one conductivity type which are disposed on opposite sides of a high resistance semiconductor channel region, and first and second gate regions formed of

semiconductor regions with the other conductivity type which are adjacent to said channel region to control a current flowing between said first and second main electrode regions, and

(a-2) a transparent electrode disposed via a capacitance on at least a portion of said first gate region, in a manner that light is incident through said transparent electrode to said first gate region in which the charge produced by the light excitation is stored to control said current;

(b) a plurality of selection lines, each of which connects the first gate regions of said picture cells in each column in common via the capacitances;



(c) a plurality of signal readout lines, each of which connects the first main electrode regions of said picture cells in each row in common, each picture cell being selected in said column and row directions so that a signal is read out therefrom; and

(d) said second gate regions of said picture cells being electrically connected in common in either of said column or row direction and being electrically isolated in the remaining row or column direction so that voltages are independently applied to said plurality of second gate regions.

4,571,625

TELEVISION CAMERA WITH A SOLID-STATE PICK-UP DEVICE

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1984, Ser. No. 571,623

Claims priority, application Netherlands, Jan. 18, 1983, 8300176

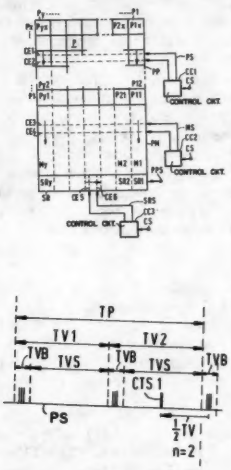
Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213 **8 Claims**

1. In a television camera creating a picture having picture periods each comprising at least a first and second field period, each of said field periods having a scan and a blanking period, said television camera having a solid-state pick-up device having pick-up elements arranged to form a plurality of columns, a control element coupled to each of said pick-up elements for transferring charge from said pick-up element to another of said pick-up elements under the control of a control signal applied thereto, the improvement comprising:

control circuit means coupled to said control elements for generating a charge transfer signal during at least one of said field scan periods in each of said picture periods;

and wherein each of said control elements transfers charge from the pick-up element coupled thereto the next subse-



quent pick-up element in the same one of said columns in response to said charge transfer signal.

4,571,626

SOLID STATE AREA IMAGING APPARATUS

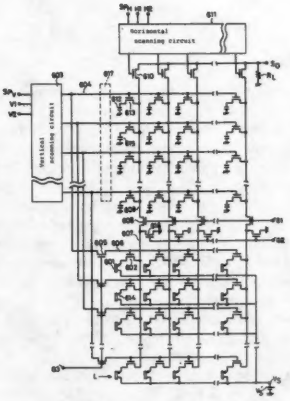
Takahiro Yamada, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 7, 1982, Ser. No. 415,544

Claims priority, application Japan, Sep. 17, 1981, 56-147671; Jan. 22, 1982, 57-9313

Int. Cl.⁴ H04N *3/11*

U.S. Cl. 358—213 **19 Claims**



1. A solid state area imaging apparatus comprising:

a semiconductor substrate of a first conductivity type,

a plurality of picture element regions which are of a second conductivity type opposite to said first conductivity type and of a high impurity concentration and disposed in a

two-dimensional pattern on a principal face of said semiconductor substrate,

selection means formed on said semiconductor substrate with close proximity to respective ones of said picture element regions for selecting desired ones of said picture element regions,

signal readout means formed on said semiconductor substrate for reading out electric signal of said selected desired ones produced by radiations incident thereon responding to said selection,

the above-mentioned parts forming an integrated circuit, and

a high resistivity region which is formed by epitaxial growth on said substrate and connected to said picture element regions for opto-electronic conversion function to utilize both the holes and electrons, and

a transparent electrode formed on said high resistivity region,

the above-mentioned parts and said picture element regions forming photo-transistors,

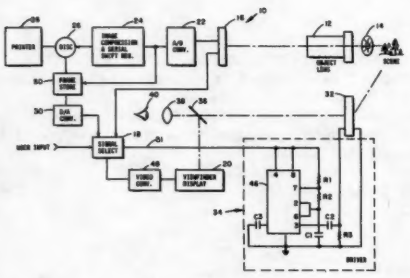
voltage impressing means for impressing a voltage on said transparent electrode to bias said high resistivity region to produce depletion mode operation of majority carriers in said picture element regions.

4,571,627

ELECTRONIC VIEWFINDER

John W. Stempeck, Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 2, 1984, Ser. No. 667,846
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—224 **15 Claims**



1. An electronic viewfinder for an electronic imaging camera of the type comprising a photoresponsive scene light sensing device for converting incident image defining scene light rays to electronic signal information and means for recording the electronic signal information, said electronic viewfinder comprising:

an electrically alterable light modulator stationed to receive incident image defining scene light rays from the field of view defined by the camera, and transmitting such received image defining light rays for viewing by the camera user upon actuation of said light modulator into a light transmissive mode of operation;

electronically actuatable visual display means for providing a visual display of an image defined by electronic signal information input thereto;

optic means for directing the image defining light rays from said display means and the scene light transmitted by said light modulator to a common area for viewing by the camera user; and

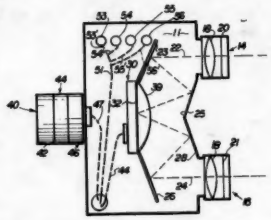
control means for either actuating said light modulator to operate in its said light transmissive mode while simultaneously deactivating said visual display means so as not to provide its visual display or deactivating said light modulator to operate in a scene light blocking mode while simultaneously activating said visual display means so as to provide its said visual display.

4,571,628

PORTABLE VIDEO VIEWING ASSEMBLY

Thirstol Thornton, 13431 SW. 102 La., Miami, Fla. 33186

Filed Mar. 23, 1984, Ser. No. 592,944
Int. Cl.[4] H04N *5/335, 5/76, 9/30*
U.S. Cl. 358—224 **7 Claims**



1. A portable video viewing mechanism of the type primarily designed for instant video viewing and selective substantially concurrent playback, said viewing mechanism comprising:

(a) housing means being of portable dimension and configuration and including a viewing assembly structured to provide viewing by a user into the interior of said housing means,

(b) an object lens assembly mounted on said housing means in spaced relation to said viewing assembly and disposed and structured for selective observation of a predetermined field of viewing,

(c) image processor means including a video camera structured to convert visual images into electrical video signals and render said electrical video signals capable of additional processing,

(d) signal processing means electrically interconnected to said image processor means and structured to process video signals into standard, synchronized coded signals,

(e) video recorder means electrically interconnected to said signal processing means and located remotely from said housing means,

(f) video screen means mounted within said housing in electrical communication with said video recorder means and structured to receive video signals therefrom and convert said signals into visual display within said housing means, said video screen means comprising liquid crystal display means disposed in interruptive relation to said line of sight viewing defined at least in part by said viewing assembly,

(g) said viewing assembly comprising a dispersion lens means disposed in visually projecting relation to a visual display projected from said liquid crystal display means and structured to disperse said visual display in full and complete communication with said viewing assembly,

(h) said dispersion lens means being disposed in overlying, immediately adjacent relation to said liquid crystal display means and comprising a convex configuration structured to project said visual image over said line of sight of said viewing assembly on the interior of said housing means,

(i) said viewing assembly comprising independent viewing sub-assemblies structured to define independent lines of sight from the separate eyes of the user of said viewing mechanism, and each of said viewing sub-assemblies including a lens element and independent reflection means disposed to at least partially define said independent lines of sight extending between said separate lens elements of each viewing sub-assembly and said liquid crystal display means,

(j) control means including circuitry means structured to selectively regulate, transfer and conversion of electrical

video signals into visual image display on said liquid crystal display means, whereby a user may instantaneously observe said predetermined field of viewing as visual display on said liquid crystal display means and selectively view substantially concurrent replay of said observed field of viewing.

4,571,629

ROTARY SHUTTER DEVICE

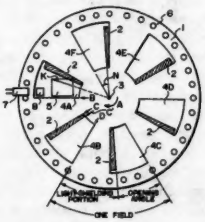
Motohiko Horio; Naoki Kobayashi, and Kouji Kaneko, all of Saitama, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed May 29, 1985, Ser. No. 739,008

Claims priority, application Japan, Jul. 12, 1984, 59-144894; Jul. 20, 1984, 59-109873[U]

Int. Cl.⁴ H04N *5/30*

U.S. Cl. 358—225 **4 Claims**



1. A rotary shutter device comprising:

(i) a solid-stage imaging device for converting an optical image focused on a photodetector surface thereof and read by successive horizontal scanning into a video signal;

(ii) a first shutter member in front of said solid-state imaging device and rotatable about its own axis, said first shutter member including a first shutter blade having at least one opening for transmitting light therethrough onto said photodetector surface;

(iii) a second shutter member disposed adjacent to said first shutter member and having a second shutter blade for varying the opening angle of said opening; and

(iv) means for rotating said first and second shutter members together to rotate said opening in a direction to successively expose said solid-state imaging device to the light in the direction in which said solid-state imaging device is vertically scanned, said solid-state imaging device being completely scannable between two successive exposures thereof through said opening.

4,571,630

ELECTRONIC CAMERA HAVING INFORMATION WRITE FUNCTION

Akira Tamagawa; Tadashi Kimura; Kazunori Mizokami; Juro Kikuchi; Yutaka Yunoki, and Kazuo Nakamura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,070

Claims priority, application Japan, Mar. 10, 1982, 57-36614

Int. Cl.⁴ H04N *5/225*

U.S. Cl. 358—226 **5 Claims**

1. A electronic camera having an information write function, comprising:

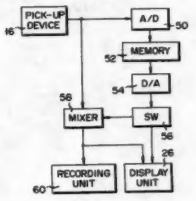
an imaging lens;

image pick-up means for photo-electric converion of an object image incident thereon through said imaging lens;

information image generating means for emitting an information image corresponding to information to be written with respect to said object image, at a time different from the time when the object image incident on said image pick-up means through said imaging lens is converted by said image pick-up means;

optical means interposed between said image pick-up means and said information image generating means, for projecting the information image onto said pick-up means; and

signal mixing means electrically connected to said image pick-up means, for storing an image signal of a first converted one of the object image incident on said image pick-up means through the imaging lens and the information image emitted from said information image generating means, and for mixing the stored image signal and a later converted one of the object image incident on said image pick-up means through the imaging lens and the information image emitted from said information image generating means.



4,571,631

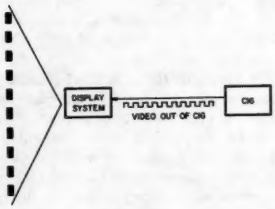
CIG DISTORTION CORRECTION WITH DELAY LINES

Denis R. Breglia, Altamonte Springs, and Benjamin W. Patz, Orlando, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1984, Ser. No. 595,876

Int. Cl.⁴ H04N *5/74*

U.S. Cl. 358—231 **12 Claims**



7. A method of correcting for tan θ to non-tan θ distortion wide angle raster video displays, comprising:

storing a digital video signal from a video signal source for a time;

fetching lines of said digital video signal in accordance with the relationship of said lines to the frame;

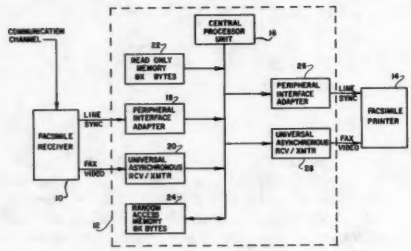
deriving a line for display from said fetched lines; and

altering the propagation time of the pixel elements along said line to correct for tan θ to non-tan θ distortion along said line in said display.

4,571,632
ALTERNATE LINE INTERPOLATION METHOD AND APPARATUS

Richard A. Schaphorst, Jenkintown, Pa., and Charles D. Bodson, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,763
Int. Cl.⁴ H04N *7/12*
U.S. Cl. 358—260 **8 Claims**



1. A method of digital facsimile transmission and reception, said method comprising:

scanning the image to be transmitted so as to produce a plurality of scan lines for transmission;

transmitting only alternative scan lines of the scanned image so that every other scan line is missing from the transmitted image;

and receiving the transmitted scan lines and interpolating the missing scan lines between the transmitted scan lines;

said interpolating step comprising: comparing for each picture element of the scan line to be interpolated, the colors of the directly adjacent picture elements of the two adjacent transmitted scan lines between which the missing line is to be interpolated, and

(a) if the colors of the directly adjacent picture elements are the same, interpolating the interpolated picture element as that color; and (b) if the colors of the directly adjacent picture elements are different, comparing the individual picture elements of the next two adjacent pairs of picture elements of said adjacent transmitted scan lines on either side of the directly adjacent picture elements, and

(i) if the colors of the individual picture elements of either pair of said next adjacent pairs are the same, and the two pairs are not of opposite colors, interpolating the interpolated picture element as that color;

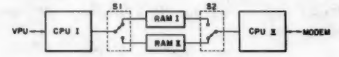
(ii) if the individual picture elements of each pair of said next adjacent pairs are the same and the two pairs are of opposite color, interpolating the interpolated picture element as a given color of said colors; and

(iii) if neither one of the pairs of said adjacent pairs of picture elements comprises picture elements of the same color, comparing the picture elements of the two next most adjacent pairs of picture elements and repeating steps (i) to (iii) until at least one pair of the adjacent picture elements measured in sequence from the directly adjacent picture elements on both sides thereof is determined to comprise picture elements of the same color, and thereafter interpolating the interpolated picture element in accordance with steps (i) and (ii).

4,571,633
HIGH-SPEED FACSIMILE MACHINE CAPABLE OF PARALLEL PROCESSING

Mitsuru Kondo, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Jul. 8, 1983, Ser. No. 512,416
Claims priority, application Japan, Jul. 12, 1982, 57-120806
Int. Cl.⁴ H04N *1/40, 1/46, 1/32*
U.S. Cl. 358—280 **6 Claims**



1. A facsimile communication machine having a transmission mode and a receiving mode, comprising:

A pair of memories each capable of temporarily storing picture data, coded or uncoded;

reading means for reading an original image to be transmitted to produce first uncoded picture data;

coding means for converting said first uncoded picture data into first coded picture data to be transmitted;

decoding means for converting second coded picture data received by said machine from a remote terminal into second uncoded picture data;

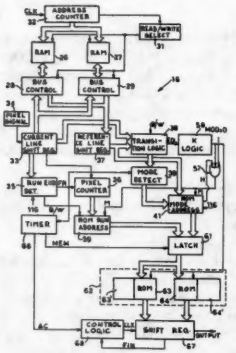
recording means for recording said second uncoded picture data in a visual format; and

a system control unit for controlling the operation of said machine, said system control unit including a first central processing unit (CPU) for controlling the operation of at least said reading and recording means and a second central processing unit (CPU) for controlling the operation of at least said coding and decoding means, said first and second central processing units being switchingly connectable to said pair of memories, respectively, thereby allowing to operate one of said reading and recording means and one of said coding and decoding means in parallel.

4,571,634
DIGITAL IMAGE INFORMATION COMPRESSION AND DECOMPRESSION METHOD AND APPARATUS

Mario Caneschi, Siena, and Giorgio Tadini, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Mar. 10, 1983, Ser. No. 473,966
Claims priority, application Italy, Mar. 19, 1982, 67351 A/82
Int. Cl.⁴ H04N *1/00*
U.S. Cl. 358—261 **29 Claims**



1. A method for the compression and decompression of digital image information, for indicating at least two separate

colours and an half tone colour, wherein a code representing a run of pixels can be formed from pixels which are all of one or the other of two colours or from the half tone run formed by an alternation of pixels of the two colours, characterised in that coding is effected separately in respect of a first half-tone run which begins with one colour and a second half-tone run which begins with the other colour, whereby there are four different types of run.

4,571,635

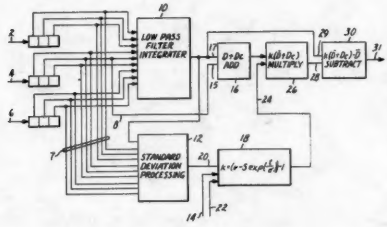
METHOD OF IMAGE ENHANCEMENT BY RASTER SCANNING

A. B. Mahmoodi, Minneapolis, and Owen L. Nelson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 17, 1984, Ser. No. 581,333

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—284 **21 Claims**



1. A method of displaying or recording an image showing enhanced detail relative to an original image or record comprising:

(a) making a point by point record of the original image by scanning it in a manner to select successive pixels in a logical array,

(b) storing the pixel values in such a way and for such a period that a window comprising a sub-array of adjacent pixels can be selected and analysed statistically said window comprising between 5 and 225 pixels,

(c) analyse the pixel values of the window surrounding each pixel in turn to give the average value $\overline{D}$ and the standard deviation σ,

(d) processing the central fixed value D_c to give an improved value D'_c such that

$$D_c' = kD_c + (1-k)D$$

wherein k is a variable having a value between 0 and 0.99 which varies from pixel to pixel based on the value of σ, said value of k being related monotonically to σ in such a way as to have an upper and lower bound within the said range 0 to 0.99,

(e) displaying or recording the enhanced image based on the derived values D_c'.

4,571,636

DEVICE FOR READING IMAGES OF BOTH SURFACES OF AN ORIGINAL IN ONE PASS

Satoru Itoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,834

Claims priority, application Japan, Dec. 21, 1982, 57-222904

Int. Cl.[4] H04N *1/40, 1/10*

U.S. Cl. 358—285 **12 Claims**

1. An image reading device, comprising:

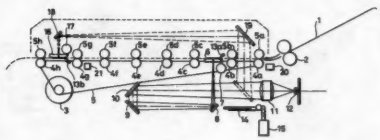
first and second platens located on opposite sides of a conveying path on an original, said first and second platens being separated along a lengthwise direction of said path by a distance which is longer than a maximum length of an original to be read;

means for feeding and conveying an original past said first and second platens;

first and second illuminating means for illuminating said first and second platens, respectively;

a single sensor means;

lens means disposed in front of said sensor means; and



mirror means for successively reflecting a light beam reflected from first and second surfaces of an original being conveyed past said first and second platens through said same lens means, said lens means thereby successively forming an image of said first and second surfaces on said same single sensor means, which converts said images into electrical signals, said first and second surfaces being on opposite sides of said original.

4,571,637

DEVICE FOR OPTICALLY SCANNING A DOCUMENT

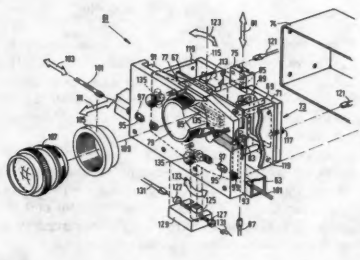
Martinus L. G. Thoone, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1984, Ser. No. 572,676

Claims priority, application Netherlands, Jan. 25, 1983, 8300250

Int. Cl.[4] H04N *1/10, 1/02, 1/04*

U.S. Cl. 358—293 **4 Claims**



1. An apparatus for optically scanning a document comprising:

an optical system having at least two imaging systems for imaging at least two contiguous narrow strips of said document;

means for displacing said imaged narrow strips at right angles to the longitudinal axis of said document whereby said document is scanned along its length;

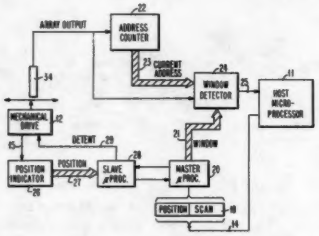
at least two linear opto electronic transducers for detecting each of said imaged narrow contiguous strips, said transducers aligned with each other and spaced apart at ends thereof; and

adjustment means for displacing each of said transducers with respect to a respective imaging system, whereby said imaged narrow strips of said document are positioned over a respective opto-electronic transducer.

4,571,638
RANDOM-ACCESS ELECTRONIC CAMERA

Eric C. Schneider, Redwood City; Elaine Hebard, Los Altos, and Stuart D. Rumley, Redwood City, all of Calif., assignors to Datacopy Corporation, Mountain View, Calif.

Filed May 2, 1983, Ser. No. 490,746
Int. Cl.[4] H04N *1/10*
U.S. Cl. 358—293 **14 Claims**



1. For use with a scanner which includes a focusing lens for focusing, at the image focal plane of said lens, the image of an object to be scanned;

an array of the type in which light-sensitive devices are scanned in accordance with a self-scanning cycle to provide information within said scanned image in the form of a train of output pulses proportional in magnitude to the light intensity falling upon each successively scanned light-sensitive device; and

means for moving said array in the image plane of said lens to thereby scan said image;

a random access controller comprising:

first means for receiving a command, said command including mechanical positional parameters and electronic scan parameter;

said first means including means for decoding said command to produce first and second decoded command signals, said positional parameters in said command being qualified by said first decoded command signals and said electronic scan parameters in said command being qualified by said second decoded command signals;

second means connected to said first means and to said means for moving said array, responsive to said first decoded command signals for mechanically positioning said array in accordance with said positional parameters in said command as qualified by said first decoded command signals; and,

third means connected to said first means and to said self-scanning linear array, responsive to said second decoded command signals for selectively gating particular ones of said pulses in said train of output pulses from said array in accordance with said electronic scan parameters in said command as qualified by said second decoded command signals.

4,571,639
DROPOUT COMPENSATION CIRCUIT FOR A VIDEO REPRODUCING SYSTEM

Yoshitake Nagashima, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 17, 1983, Ser. No. 495,416
Claims priority, application Japan, May 20, 1982, 57-85214
Int. Cl.[3] H04N *9/491*
U.S. Cl. 358—314 **7 Claims**

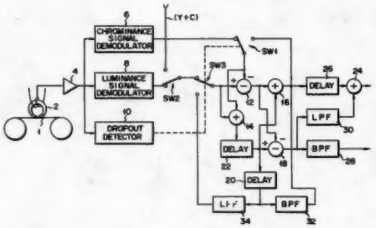
1. A dropout compensation circuit for a color video reproducing system which receives chrominance and luminance signals of a video signal reproduced from a video recording medium, said compensation circuit comprising:

signal generating means for receiving at a first input terminal said luminance signals and at a second input terminal said chrominance signals which include a crosstalk component that is phase-inverted for each horizontal scanning period, and for generating sum and difference signals corresponding to the sum and difference of said chrominance and luminance signals;

first delay means for delaying said difference signals of said signal generating means by one horizontal scanning period;

adding means for adding said sum signals from said signal generating means and said delayed difference signals from said first delay means, to produce an output signal including said chrominance and luminance signals with said crosstalk component cancelled;

second delay means for delaying said difference signals of said signal generating means by two horizontal scanning periods;



signal separating means for separating said chrominance and luminance signals from said delayed difference signals of said second delay means;

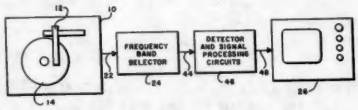
dropout detection means for detecting dropout of said video signal to said signal generating means; and

signal selecting means for applying said chrominance and luminance signals as reproduced from the video recording medium in an ordinary reproduction mode and supplying the reproduced chrominance and luminance signals to said signal generating means in an ordinary reproduction mode as indicated by detection of said video signal by said dropout detection means, and for applying said chrominance and luminance signals from said signal separating means to said signal generating means when the reproduced video signal is detected by said dropout detector means as being dropped out.

4,571,640
VIDEO DISC PROGRAM BRANCHING SYSTEM

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 1, 1982, Ser. No. 438,139
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—342 **9 Claims**



1. A video disc program branching system comprising:

a video disc player;

a video disc having recorded thereon a plurality of groups of signals co-located on substantially the same portion of the disc, each group containing different program material recorded at different frequencies; and

means for branching by selecting predetermined ones of said multiple programs.

4,571,641
INFORMATION RECORDING DEVICE

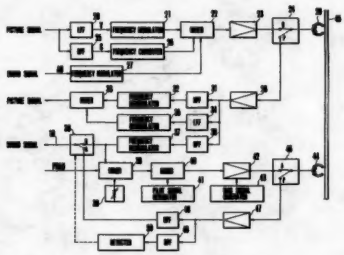
Makoto Fujiki, Tokyo, and Makoto Takayama, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 620,867, Jun. 15, 1984, Pat. No. 4,549,236, which is a continuation of Ser. No. 335,339, Dec. 21, 1981, Pat. No. 4,480,273. This application Jun. 11, 1985, Ser. No. 743,587

Claims priority, application Japan, Jan. 7, 1981, 56-1334

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—19.1 **9 Claims**



1. A video tape recorder comprising:

(a) mixing means for mixing a video signal and a first audio signal to form a composite signal;

(b) first recording means for recording the composite signal on a first area of a magnetic tape, said first recording means including at least one rotating head;

(c) first reproducing means for reproducing the composite signal from the first area of the magnetic tape;

(d) separation means for separating the first audio signal and the video signal from the composite signal reproduced by said first reproducing means;

(e) second recording means for recording a second audio signal on a second area of the magnetic tape, said second recording means including a fixed head;

(f) second reproducing means for reproducing the second audio signal from the second area of the magnetic tape; and

(g) output control means for setting the output mode of the recorder at least to the following two modes:

a first output mode by which only the video signal separated by said separation means and the first audio signal separated by said separation means are simultaneously output; and

a second output mode by which only the video signal separated by said separation means and the second audio signal reproduced by said second reproducing means are simultaneously output.

4,571,642
METHOD OF AND APPARATUS FOR MODIFYING A VIDEO SIGNAL TO PREVENT THE UNAUTHORIZED RECORDING AND REPRODUCTION THEREOF

Steven R. Hofstein, 44 Hidden Lake Dr., North Brunswick, N.J. 08902

Filed Aug. 24, 1981, Ser. No. 295,670

Int. Cl.⁴ H04N *5/78, 1/44*

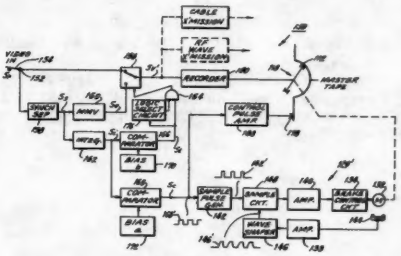
U.S. Cl. 360—37.1 **5 Claims**

5. A video tape, comprising:

a magnetic tape;

video information stored on said magnetic tape in the form of a plurality of video tracks, each of said video tracks containing a vertical synch pulse including a plurality of subpulses, selected ones of said vertical synch pulses being modified by varying the number, width or height of said subpulses in said modified synch pulse;

said vertical synch pulses being divided into a plurality of successive groups of synch pulses, each group including a plurality of successive synch pulses, the sequence of modified and unmodified synch pulses in each said group defining a modified synch pulse pattern for that group, said



modified synch pulse pattern of each said group being the same as said modified synch pulse pattern of some, but not all, of the other of said groups, in such a manner that such tape includes a plurality of different modified synch pulse patterns interspaced through said tape.

4,571,643
VTR CIRCUIT ARRANGEMENT FOR RECORDING INDEX SIGNAL

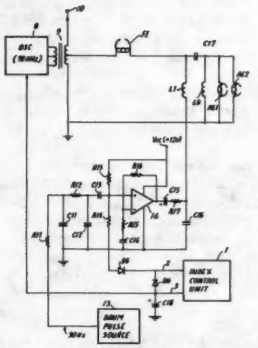
Yasuomi Namiki, Yokohama, Japan, assignor to Victor Company of Japan Limited, Yokohama, Japan

Filed Dec. 1, 1983, Ser. No. 556,780

Claims priority, application Japan, Dec. 2, 1982, 57-212023

Int. Cl.⁴ G11B *5/03, 6/02*

U.S. Cl. 360—66 **6 Claims**



1. A circuit arrangement for use in a video tape recorder of the helical scan type for recording an index signal prior to the recording of a video signal, said recorder including an erase head for erasing a material prerecorded on a video tape and a video head mounted on a rotary drum for recording said video signal, the video head being located downstream of the erase head in the direction of movement of the video tape, comprising:

a first circuit for generating a low frequency index signal for a predetermind duration prior to the recording of said video signal;

a second circuit for generating a high frequency signal simultaneously with said index signal and continuously after the termination of said index signal; and

means for directly coupling said index signal and said high frequency signal to said erase head to record said index

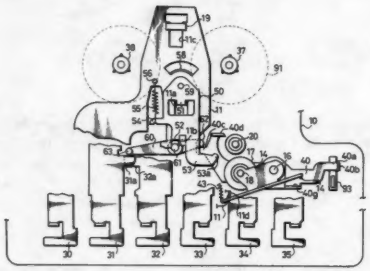
signal on said tape with the high frequency signal acting as a bias and to allow said high frequency signal to erase said prerecorded material after said index signal has been recorded.

4,571,644

TAPE RECORDER

Kazuo Fukuda, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,394
Claims priority, application Japan, Feb. 22, 1982, 57-22704
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—90 **6 Claims**



1. A tape recorder having a first lever for actuating a normal play mode and a second lever for actuating fast forward/cue modes, the tape recorder comprising:

a chasis;

a take up reel block rotatably mounted on said chasis;

a head base slideably mounted on said chasis;

an idler wheel shaft slideably coupled to the chasis;

an idler wheel rotatably mounted on the idler wheel shaft;

a rotational power source means mounted on said chasis; and

engagement means for actuating the fast-forward/cue modes;

where the rotational power source means normally engages the idler wheel and the idler wheel normally engages the take up reel block when the first lever is fully actuated; and

wherein the engagement means for actuating the fast forward/cue modes is engageable with the idler wheel shaft and capable of separating the idler wheel from the rotational power source means when said second lever is partly actuated, thereby breaking a path of power transmission from the rotational power source means to the take up reel block by way of the idler wheel.

4,571,645

HORIZONTAL FLEXIBLE DISK LOADING AND SORTING/COLLATING MECHANISM

Ronald R. Johnson, Shorewood; Walter Gysling, Excelsior; David C. Burns, Mound; Richard D. Schuelke, Jordan, and James A. Sieben, Mound, all of Minn., assignors to IXI Laboratories, Inc., Shorewood, Minn.

Continuation of Ser. No. 402,841, Jul. 29, 1982, abandoned. This application Jan. 10, 1985, Ser. No. 690,514
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—98 **19 Claims**

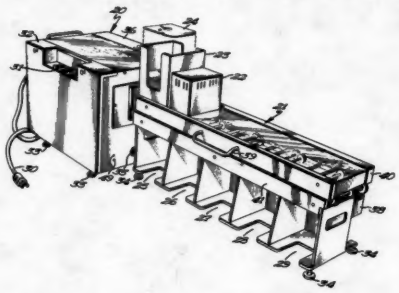
1. Floppy disk handling apparatus comprising:

(a) a box-like hopper for holding a plurality of floppy disks in a stacked relationship, said hopper having an exit opening along a lower edge thereof:

(b) a picker mechanism having a gate at a predetermined elevation for separating the disks in said hopper and moving the lowermost floppy disk in the stack through said exit opening in said hopper;

(c) reversible pinch roller drive means for selectably moving a picked one of said floppy disks exiting said opening in a first direction;

(d) a rotatable floppy disk drive means including a frame and a disk motor disposed on said frame, said disk drive means being positioned adjacent said picker mechanism and being adapted to receive said floppy disk when said floppy disk is moved in said first direction and to provide a predetermined rotational movement to same;



(e) sensor means disposed proximate one edge of said floppy disk drive means for detecting movement of the edge of a picked one of said floppy disks; and

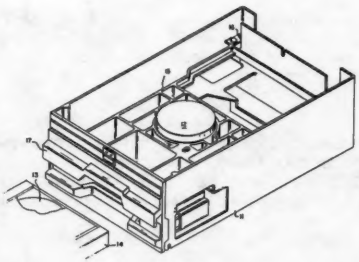
(f) diverter means operatively coupled to said sensor means and said frame of said floppy disk drive means for moving said rotatable floppy disk drive means frame to an elevation other than said predetermined elevation upon actuation of said diverter means by said sensor means.

4,571,646

MAGNETIC DISK DRIVE HAVING A MOVABLE DRIVE MOTOR

Randall C. Bauck, Layton; S. Peter Kleczkowski, and Anton J. Radman, both of Ogden, all of Utah, assignors to Iomega Corporation, Ogden, Utah

Continuation-in-part of Ser. No. 256,594, Apr. 22, 1981, Pat. No. 4,502,083. This application Nov. 9, 1982, Ser. No. 440,335
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] G11B *5/016*
U.S. Cl. 360—99 **14 Claims**



1. A magnetic disk drive for writing and reading data to and from a magnetic disk contained in a cartridge which is inserted through an opening into said disk drive comprising:

a yoke rotatable about a pivot in said disk drive;

a bezel member mounted on the end of said yoke to normally close said opening;

a motor having a spindle for engaging said magnetic disk to rotate it, said motor being mounted on said yoke so that

rotation about said pivot moves said bezel member out of said opening and moves said motor out of engagement with said disk and opposite rotation of said yoke moves said bezel member into said opening and moves said motor spindle into engagement with said disk; and

a Bernoulli plate between said disk and said motor, the spindle of said motor engaging said disk through a hole in said plate, said spindle being pulled through said hole by rotation of said yoke to disengage said motor from said disk.

4,571,647

TAPE RECORDER

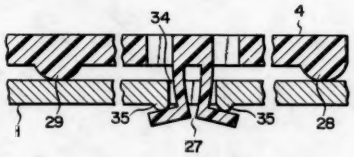
Shinsaku Tanaka, and Tadao Arata, both of Tokyo, Japan, assignors to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,192

Claims priority, application Japan, Jan. 27, 1982, 57-9560[U]

Int. Cl.⁴ G11B *21/22, 5/54*

U.S. Cl. 360—105 **12 Claims**



1. A tape recorder comprising:

a base plate;

at least one reel shaft mounted on said base plate for rotating a reel, said reel having magnetic tape wound thereon;

a head holder slidably mounted on said base plate;

at least one magnetic head mounted on said head holder;

said head holder being slidable between first and second positions over one surface of said base plate, said first position being a position where said at least one magnetic head is spaced from said magnetic tape, and said second position being a position where said at least one magnetic head is in contact with said magnetic tape;

a guide piece on said base plate;

an elongated guide slot in said head holder for receiving said guide piece to restrict movement of said head holder in a direction along the length of said guide slot; and

at least one projection provided on a surface of said head holder adjacent an end of said guide slot, said guide piece having an end portion which is arranged to engage said projection for only a limited excursion when said hed holder is in the vicinity of said second position while being moved from said first position to said second position where said at least one magnetic head contacts said magnetic tape, said projection contacting said end portion of said guide piece to forcibly urge said head holder against said base plate during said limited excursion to fixedly position said at least one magnetic head relative to the width of the magnetic tape, said at least one projection being out of contact with said end portion of said guide piece when said head holder is at its first position and when it is not in the close vicintiy of said second posotion.

4. A tape recorder comprising:

a base plate;

at least one reel shaft mounted on said base plate for rotating a reel, said reel having magnetic tape wound thereon;

a head holder slidably mounted on said base plate;

at least one magnetic head mounted on said head holder;

said head holder being slidable between first and second positions relative to said base plate, said first position being a position where said at least one magnetic head is spaced from said magnetic tape, and said second position being a position where said at least one magnetic head is in contact with said magnetic tape;

a guide piece on said head holder said guide piece being made of a synthetic resin;

a guide groove in said base plate for receiving said guide piece to restrict the direction of movement of said head holder; and

at least one projection provided on a surface of said base plate adjacent an end of said guide slot, said guide piece having an end portion which is arranged to engage said projection for only a limited excursion when said head holder is in the close vicinity of said second position while being moved from said first position to said second position where said at least one magnetic head contacts said magnetic tape, said projection contacting said end portion of said guide piece to forcibly urge said head holder against said base plate during said limited excursion to fixedly position said at least one magnetic head relative to the width of the magnetic tape, said at least one projection being out of contact with said end portion of said guide piece when said head holder is at its first position and when it is not in the close vicinity of said second position.

4,571,648

DEVICE FOR LOADING THE MAIN BODY OF A PLATFORM CONTAINING AT LEAST ONE READ/WRITE TRANSDUCER OF A DATA MEDIUM

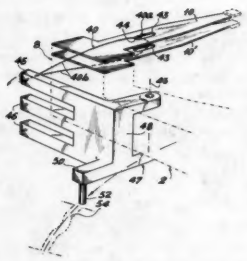
Guy Barski, Paris, France, assignor to Cii Honeywell Bull, Paris, France

Filed Feb. 16, 1983, Ser. No. 467,202

Claims priority, application France, Mar. 15, 1982, 82 04349

Int. Cl.⁴ G11B *5/54, 21/22*

U.S. Cl. 360—105 **13 Claims**



1. A device for loading a main body of a platform of the type that includes the main body and a suspension mechanism for the main body, the main body supporting a read/write transducer adapted to be operatively positioned with respect to a surface of a data medium, the device comprising a movable arm; a pair of flexible spring plates, each having a first end attached to the arm and one of the spring plates having a second end which supports the platform, said one spring plate being formed such that the second end presses the main body against the surface of the data medium; and means for deforming said one spring plate so as to cause the second end to move substantially perpendicularly away from the surface of the data medium, the deforming means comprising a wire connected to the pair of spring plates, and means for applying a force to the wire substantially parallel to the surface of the data medium.

4,571,649

DISK DRIVE CARRIAGE STRUCTURE

Lloyd C. Goss, Bloomington, Minn., assignor to Magnetic Peripherals, Inc., Minneapolis, Minn.

Filed Aug. 18, 1982, Ser. No. 409,386

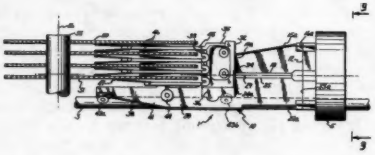
Int. Cl.⁴ G11B *5/55, 21/08, 5/012, 5/016*

U.S. Cl. 360—106 **8 Claims**

1. In a disk memory assembly having at least one disk mounted for rotation on a spindle, a coil assembly, and a plural-

ity of heads supported by a plurality of arms, wherein each of said heads is positioned operationally proximate a disk, said spindle having an axis of rotation, the improvement comprising:

a carriage structure having a tower extending parallel to the spindle axis and comprising two sidebeams and a crossbeam connecting the sidebeams and having bearings for supporting said carriage structure for rectilinear movement on a supporting shaft under the influence of said coil assembly, said arms being supported by said tower side



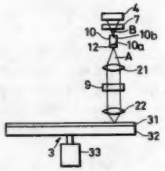
facing the disk spindle, said carriage structure including two upper and two lower rigid, planar fins, each fin having inner and outer edges and forward and rearward ends, each of said upper fins being at its forward end joined to the tower with an end of its outer edge adjacent one crossbeam and each of said lower fins being at its forward end joined to the tower, each fin at its rearward end secured to said coil assembly, and all of said fins being joined along their inner edges to form a central beam, each of said fins forming an acute angle with respect to the spindle axis, whereby the carriage rigidity is improved.

4,571,650

MAGNETO-OPTIC INFORMATION STORAGE SYSTEM UTILIZING A SELF-COUPLED LASER

Masahiro Ojima; Toshio Niihara, both of Kokubunji, and Hideo Fujiwara, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,679
Claims priority, application Japan, Sep. 7, 1982, 57-156142
Int. Cl.[4] G11B *7/00, 11/00*
U.S. Cl. 360—114 **20 Claims**



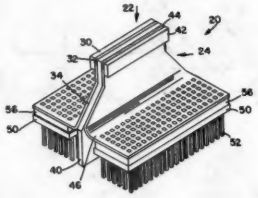
1. An optical information storage system comprising laser means for generating a first laser beam, magnetic storage means arranged for being irradiated by the first laser beam and for reflecting light of the first laser beam therefrom, the magnetic storage means enabling recording of information by a change in the magnetic direction thereof, the light reflected from the magnetic storage means being indicative of the information recorded on the magnetic storage means, the laser means being responsive to the light reflected from the magnetic storage means for generating a second laser beam, photodetection means being responsive to the second laser beam for providing an output signal in accordance therewith, rotation means arranged in an optical path along which the light reflected from the magnetic storage means returns to the laser means for modifying the light reflected from the magnetic storage means in accordance with a predetermined polarization rotating angle thereof, the rotation means having the predetermined rotating angle selected so that a polarization plane of the second laser beam is changeable in dependence upon the magnetized direction of the information of the magnetic storage means, and analyzer means interposed between the laser means and the photodetection means for extracting at least one polarization component from the second laser beam, the photodetection means being responsive to the at least one extracted polarization component for providing an output signal indicative of the information recorded on the magnetic storage means.

4,571,651

METHOD OF MANUFACTURING A MAGNETIC HEAD ASSEMBLY AND PRODUCT

James Reid, Santa Ynez, and Gary E. Roberts, Santa Barbara, both of Calif., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed Oct. 14, 1983, Ser. No. 542,051
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 **23 Claims**



1. A method of manufacturing a transducing subassembly for a magnetic head assembly adapted for use with a recording medium comprising the steps of

affixing a transducer onto a substrate wherein the transducer includes a transducing element located on one side thereof and leads located on a different side thereof and wherein the substrate is formed of a material which is highly resistant to being abraded by a recording medium being transported thereacross and the substrate has a medium contacting surface and a supporting surface which is substantially perpendicular to the medium contacting surface and wherein the transducer is affixed to the support surface such that the transducing element of the transducer is located adjacent the medium contacting surface and with the leads of the transducer extending along the supporting surface away from the medium contacting surface;

bonding a spacer to the substrate and transducer wherein the spacer is formed of a material which is highly resistant to being abraded by a recording medium and has a medium contacting surface of a preselected width and sidewalls extending substantially perpendicular therefrom a distance equal to the length of the transducing element and the spacer is positioned adjacent the substrate supporting surface with one of the spacer sidewalls contiguous the transducer which is located therebetween and the spacer medium contacting surface is positioned adjacent the transducing element;

bonding an electrical circuit means to the substrate and transducer wherein the electrical circuit means terminates in an edge having a width which does not exceed said preselected width and wherein the electrical circuit means has spaced, opposed outer surfaces extending from the edge with one of the outer surfaces having exposed conductors and the electrical circuit means is positioned with the edge thereof adjacent the transducer in opposed, spaced alignment from said spacer and with the outer surfaces thereof having the exposed conductors positioned adjacent the substrate supporting surface and in electrical contact with said leads of the transducer; and

applying a clamping force to the transducing subassembly during the bonding steps.

4,571,652

MAGNETIC RECORDING AND REPRODUCING APPARATUS

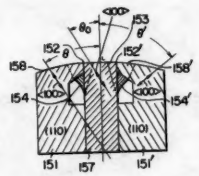
Hideo Fujiwara, Tokorozawa; Shigekazu Otomo, Sayama; Kiminari Shinagawa, Kanagawa; Noriyuki Kumasaka, Ome; Takeo Yamashita, Hachioji; Mitsuhiro Kudo, Tokyo, and Teizo Tamura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,224

Claims priority, application Japan, Nov. 27, 1981, 56-189330

Int. Cl.[4] G11B *5/22*

U.S. Cl. 360—122 **16 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a magnetic head having a plurality of core member facing each other with a gap being formed therebetween in a surface facing a magnetic recording medium, at least a portion of at least one of said magnetic core members which is in the vicinity of said gap being made of a M_nO-Z_nO ferrite single crystal, a {110} plane of at least one M_nO-Z_nO ferrite single crystal being substantially parallel to a plane forming a principal magnetic circuit, <100> directions contained in said {110} planes being inclined to said surface facing said magnetic recording medium; with the proviso that when a plurality of said ferrite single crystals have the inclined <100> directions, said <100> directions are inclined in the same directions; and

means for relatively sliding said magnetic recording medium in opposite and parallel direction to a projection vector on said surface facing said recording medium, of a vector directed from a site far from said surface to a site near said surface is said <100> direction projected in the sliding direction of said magnetic recording medium in said surface facing said magnetic recording medium.

4,571,653

PERPENDICULAR MAGNETIC RECORDING HEAD

Toshiyuki Suzuki, and Masanori Isshiki, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,738

Claims priority, application Japan, Oct. 8, 1981, 56-159476

Int. Cl.[4] G11B *5/12, 5/27, 5/28, 5/25*

U.S. Cl. 360—125 **4 Claims**

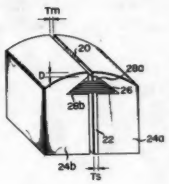
1. A perpendicular magnetic recording head comprising:

a pole formed of a highly permeable magnetic thin film having one end thereof facing the magnetic surface of a recording medium;

a side member formed of a highly permeable magnetic material jointed with one film surface of said pole, said pole protruding by a predetermined length from one end of said side member;

a nonmagnetic holder means in contact with a surface of said thin film and in contact with a surface of said side member for holding said pole and said side member, an upper surface of said nonmagnetic holder means formed in a curved surface with the top portion of said curved surface being level with said one end of said pole;

a coil hole formed in said nonmagnetic holder means on both sides of said jointed side member and pole, said hole gradually increases in width from said one end of said side member toward the other end of said side member in order to allow said predetermined length of said pole to be made substantially small and to maintain the mechanical strength of said nonmagnetic holder means, wherein the upper end surface of said coil hole formed by said gradually increasing width has an angle smaller than 50° with respect to a horizontal surface of said one end of said member; and



an exciter coil wound around said pole and said side member through said coil hole.

4,571,654

MAGNETIC TAPE CASSETTE HAVING IMPROVED MAGNETIC SHIELDING

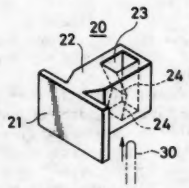
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 24, 1984, Ser. No. 653,759

Claims priority, application Japan, Oct. 26, 1983, 58-164714[U]

Int. Cl.[4] G11B *15/60*

U.S. Cl. 360—130.21 **8 Claims**



1. A magnetic tape cassette for use in a cassette tape machine having a slide bar which is inserted through said cassette, said

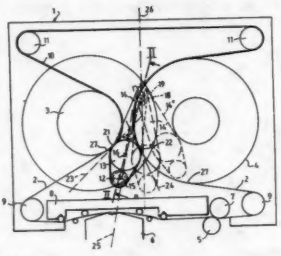
cassette having a pair of hubs on which a magnetic tape is wound, and an opening at a front side of the cassette into which a magnetic head is inserted, said cassette comprising: a cassette case body having first through-holes located behind said opening and penetrating said cassette case body substantially parallel to said front side; and a shield member in said cassette slidable toward and away from said opening and urged away from said opening by an elastic member, said shield member comprising: a body having a second through-hole which is in substantial alignment with said first through-holes of said cassette body, and a shield wall of said shield member which confronts said magnetic head when said head is inserted into said opening, said slide bar being inserted into said second through-hole of said body, thereby causing said shield member to slide toward said front side of said cassette.

4,571,655

MAGNETIC CASSETTE WITH FLOATING AND AUXILIARY TENSIONING ROLLERS

Jean-Pierre Merle, Clamart, France, assignor to ENERTEC, Montrouge, France

Filed Sep. 17, 1982, Ser. No. 419,356
Claims priority, application France, Sep. 30, 1981, 81 18488
Int. Cl.[4] G11B *23/02, 5/008, 15/32;* **G03B** *1/04*
U.S. Cl. 360—132 **7 Claims**



1. A cassette for magnetic tape, of the type comprising two reels for carrying a magnetic tape, means for guiding the magnetic tape in front of a read-write device, means for driving the magnetic tape, and means for tensioning the tape comprising a cylindrical floating roller urged against the two reels by means of an endless elastic belt extending under tension between the floating roller and at least one return roller and contacting a portion of the periphery around each of the reels, the magnetic tape winding and unwinding tangentially on each reel respectively upstream and downstream of the lines of contact of the floating roller on the two reels, the improvement comprising:

at least one curved roller disposed between the floating roller and the belt;

a common rigid support to which the floating and curved rollers are mounted at one end thereof; and

means, disposed within the cassette and the end of the support opposite that of the curved roller, which means cooperate for enabling the support and floating and curved rollers to slidably and pivotally move relative to the cassette and reels,

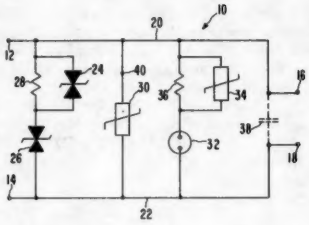
whereby the tension exerted by the belt on the curved roller is at least partially transmitted to the floating roller which divides it between each of the two reels.

4,571,656

ELECTRICAL CIRCUIT FOR PROTECTION AGAINST SURGE OVERVOLTAGE OF TRANSIENTS

Stephen E. Ruckman, Capitola, Calif., assignor to Dynatech Computer Power, Inc., Scotts Valley, Calif.

Filed Jan. 13, 1984, Ser. No. 570,703
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—56 **5 Claims**



1. An electrical circuit for surge overvoltage protection comprising:

means defining a pair of spaced leads, first ends of the leads defining signal input terminals and the second ends of the leads defining signal output terminals;

a first stage across the leads and directly connected to said input and output terminals, the first stage including a first resistor and a first zener diode in series with each other, there being a second zener diode in parallel with the first resistor;

a second stage across the leads and directly connected to said input and output terminals in parallel with the first stage, the second stage including a varistor coupled to said leads; and

a third stage across the leads and directly connected to said input and output terminals in parallel with the first and second stages, the third stage including a gas discharge tube and a second resistor in series with each other, there being a second varistor in parallel with the resistor of the third stage.

4,571,657

Patent Not Issued For This Number

4,571,658

CONTROL CIRCUIT FOR A CIRCUIT INTERRUPTER

Joseph W. Ruta, Elmhurst, Ill., assignor to S&C Electric Company, Chicago, Ill.

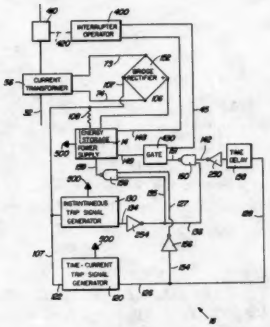
Filed Jun. 22, 1983, Ser. No. 506,942
Int. Cl.[4] H02H *3/093*
U.S. Cl. 361—96 **8 Claims**

1. A control circuit responsive to overcurrent in an alternating-current line for operating a device, said control circuit comprising:

current-producing means for producing an output current proportional to the current in the line;

power supply means responsive to said output current for storing energy, for selectively providing a source of energy, and for providing operating power outputs;

first trip signal generator means energized by said operating power outputs and responsive to the output current for producing a trip signal in response to overcurrent in the line after the passage of a time delay that is inversely related to the overcurrent in the line, said power supply means being responsive to the generation of a trip signal by said first trip signal generator means such that the energy stored by said power supply means is increased;



second trip signal generator means energized by said operating power outputs and responsive to the output current for producing a trip signal when the current in the line has a magnitude greater than a first value and has a rate of change greater than a selected rate;

switch means responsive to the trip signals from the first and second trip signal generator means for applying energy from said power supply means for operating the device; and

time delay means responsive to a trip signal from said first trip signal generator means for permitting the amount of stored energy in said power supply means to be increased before the trip signal is applied to said switch means to cause said switch means to apply stored energy from said power supply means to operate the device.

4,571,659

STATIC OVERCURRENT TRIP DEVICE TO OPERATE A CIRCUIT BREAKER IN RESPONSE OF FAULT CONDITIONS IN AN ALTERNATING CURRENT NET SYSTEM

Pierre Demeyer, Uriage, and Philippe Duval, Créteil, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Jul. 13, 1983, Ser. No. 513,283

Claims priority, application France, Jul. 12, 1982, 82 12329

Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—95 **5 Claims**

1. An electronic trip device for controlling a circuit breaker having separable contacts electrically coupled in the lines of an alternating current system, said trip device comprising:

current sensing means for measuring the intensity of current flowing in each line of an alternating current system and for generating a signal proportional in magnitude to that line current;

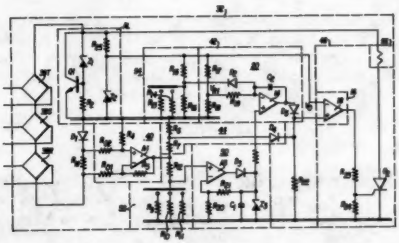
a first time-lag tripping circuit coupled to receive said signal proportional to said line current and provide a first output, said first time-lag tripping circuit including a non-linear function generator which approximates the inverse time tripping characteristics of a circuit breaker and which comprises,

an integrating analog circuit constructed as an operational amplifier having inverting and non-inverting inputs and an output,

a negative feedback capacitor having a capacitance C electrically connected between the inverting input and output of the operational amplifier,

a resistor having a first terminal and a second terminal coupled to said inverting input, said resistor having a resistance R,

first means for providing at least one reference signal as a predetermined threshold signal to the first terminal of said resistor, and



second means for coupling said signal proportional to line current through a selector and peak detector to said non-inverting input of said operational amplifier, said output of said operational amplifier defining the tripping time of the first time-lag tripping circuit wherein the tripping time t is equal to L(b-aI)/(aI-c) where I is the line current, L is the time constant RC, c is a first threshold voltage represented by said reference signal, b is a second threshold voltage and a is a proportionality coefficient set by said selector;

a second instantaneous tripping circuit coupled to receive said signal proportional to line current and provide a second output;

level detector means coupled to receive the outputs of said first and second tripping ciruits for providing a tripping signal when either of said outputs exceed another predetermined threshold voltage;

switching means for providing a switching signal in response to said tripping signal;

a tripping coil coupled to be responsive to said switching signal and operably coupled to cause the opening of the contacts in said circuit breaker in response to said tripping signal.

4,571,660

LIGHTNING ARRESTER INSULATOR

Yoshio Mitsumatsu, Aichi; Akio Kamio, Okazaki; Shoji Seike, Nagoya, and Masayuki Nozaki, Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha & NGK Insulators Chubu Electric Co., Inc., Japan

Filed Aug. 31, 1983, Ser. No. 528,032

Claims priority, application Japan, Sep. 14, 1982, 57-160555

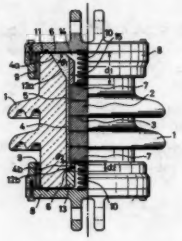
Int. Cl.[4] H02H *9/04*

U.S. Cl. 361—127 **13 Claims**

1. A lightning arrester insulator comprising:

an insulator portion having an inner wall surface defining a longitudinal bore through the insulator;

a voltage non-linear resistor consisting essentially of ZnO, said resistor being located within said longitudinal bore of the insulator;



an adhesive layer located between an outer surface of said resistor and said inner wall surface of said insulator, said adhesive layer consisting essentially of an inorganic material, said adhesive layer forming a contact angle within a range of 10° to 60° between each end surface of the adhesive layer and said inner wall surface of the insulator.

4,571,661

SEMICONDUCTOR VIBRATION DETECTION DEVICE WITH LEVER STRUCTURE

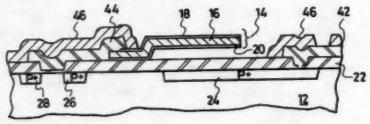
Shigeo Hoshino, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 31, 1984, Ser. No. 646,166

Claims priority, application Japan, Sep. 7, 1983, 58-163270

Int. Cl.⁴ H01G *7/00*; H01L *29/84*

U.S. Cl. 361—283 **7 Claims**



1. A vibration detection device for detecting machinery vibrations, comprising:

a semiconductor base;

a movable lever installed on said semiconductor base in the form of a cantilever to have a predetermined frequency of natural vibration, said movable lever includes two alkali-etching-proof nitride layers and an alkali-etching-proof high density P^+ polysilicon layer which is vertically sandwiched by the alkali-etching-proof nitride layers; and

a P^+ region formed on said semiconductor base opposite to the movable lever.

4,571,662

LEADLESS CAPACITORS

Alexander R. Conquest, Epping Green, and Christopher F. Powling, Paignton, both of England, assignors to Standard Telephones and Cables plc, London, England

Filed Jun. 8, 1984, Ser. No. 618,750

Claims priority, application United Kingdom, Jun. 17, 1983, 8316554

Int. Cl.⁴ H01G *9/00, 1/14, 7/00*

U.S. Cl. 361—306 **6 Claims**

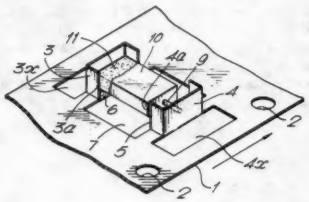
6. A solid electrolytic lead-less capacitor comprising:

a capacitor body having an anode wire projecting therefrom and a cathode connection area on the surface of the body remote from the anode wire;

a cathode connection terminal of bent metal strip and having one limb thereof connected to the cathode connection area;

an anode connection terminal of bent metal strip and having a bent-up portion extending transversely in relation to the anode wire and welded directly to the anode wire; and

the capacitor body being encapsulated solely in insulating



material which has been moulded directly around the capacitor and which has a generally rectangular external configuration, each connection terminal extending over an adjacent end face of the moulded encapsulating material and over part of a common side face of the encapsulating material for making external electrical connections to the capacitor.

4,571,663

ELECTRICAL CIRCUIT ASSEMBLIES

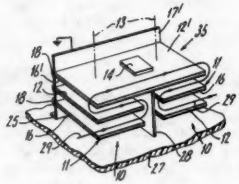
Hugh McPherson, West Linton, Scotland, assignor to Ferranti plc, Cheshire, England

Filed Jun. 13, 1983, Ser. No. 503,604

Claims priority, application United Kingdom, Jun. 19, 1982, 8217816

Int. Cl.⁴ H05K *7/14*

U.S. Cl. 361—393 **10 Claims**



1. In combination, a pair of electrical circuit assemblies; a support upon which the electrical circuit assemblies are mounted, each electrical circuit assembly comprising a stack of a plurality of substantially identically constructed modules, each such module comprising a substantially planar electrically insulating substrate extending at right angles to a longitudinal axis of symmetry of the stack, each module having circuit elements on only one major substrate surface thereof and being provided with a layer of electrically conductive material wholly coating an opposite major substrate surface, means for electrically interconnecting the modules to form a completed electrical circuit, the modules, at least partially, being held in required locations in the stack by a plurality of members extending parallel to the longitudinal axis of symmetry of and at least wholly along the stack, at least one of said members being an electrical conductor member which interconnects the electrically conductive coatings of the modules, the electrically conductive coatings of said modules and the electrical conductor member connected thereto together forming an extensive body which is maintained at zero potential so as to reduce undesired electrical interaction between the circuit elements of said modules; the pair of electrical circuit assemblies being

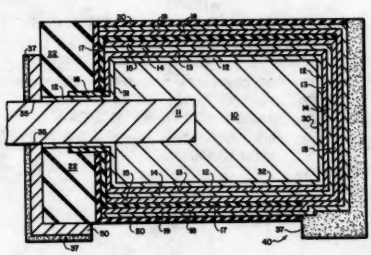
mounted on the support adjacent to one another by the plurality of members co-operating with the support, the support extending generally in a plane at right angles to the longitudinal axis of symmetry of each stack; and a common module disposed at an extremity of the pair of electrical circuit assemblies, the common module having a substrate which extends parallel to the substrates of the pair of electrical circuit assemblies and which is sized such that a portion of the common module extends over and constitutes part of each stack of modules.

4,571,664

SOLID ELECTROLYTE CAPACITOR FOR SURFACE MOUNTING

William J. Hyland, North Palm Beach, Fla., assignor to Mepco/Electra, Inc., New York, N.Y.

Filed Nov. 9, 1984, Ser. No. 670,088
Int. Cl.[4] H01G 9/00
U.S. Cl. 361—433 **8 Claims**



1. An improved solid electrolyte chip capacitor for surface mounting comprising a porous valve metal anode with one end face from which a wire of said valve metal extends; an opposite end face and at least one side face contiguous with said end faces; a dielectric film formed over the surfaces of said porous anode; an insulative coating covering said wire in proximity to said end face; a solid electrolyte over said dielectric film; a first conductive counter-electrode coating overlying said solid electrolyte over all surfaces of said solid electrolyte except said end face from which said wire extends, and extending over said opposite end face; the improvement comprising:

an insulative sealing coating applied to said entire capacitor body except for said opposite end face and a portion of one side contiguous to said opposite end face;

a second conductive coating applied over said insulative sealing coat coextensive with said first conductive coating;

a nickel-plated layer over said second conductive coating and coextensive therewith;

a second insulative coating covering said capacitor body except said opposite end face and a portion of said side contiguous with said opposite end face;

an L-shaped conductive end cap secured to said wire, spaced apart from said one end face and extending under said wire;

an insulative filler securing said end cap to said one end face; and

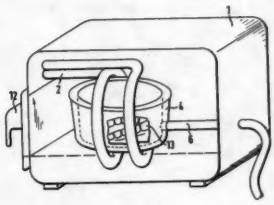
a solder coating on both conductive ends of said capacitor body.

4,571,665

APPARATUS FOR TREATING DENTAL MATERIALS

Wolf-Dietrich Herold, Hechendorf; Karl L. Grafwallner, Munich, and Michael Keller, Lochham, all of Fed. Rep. of Germany, assignors to ESPE Fabrik pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,263
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212379
Int. Cl.[4] F21S 3/00; A61N 5/00
U.S. Cl. 362—225 **17 Claims**



1. Apparatus for curing dental prosthetic part means such as crowns, single teeth, bridges, dentures and the like made of photopolymerizable material, comprising:

a housing,

receiving means disposed in said housing for accomodating the prosthetic part means to be treated,

at least one fluorescent tube disposed in said housing for emitting radiation in the spectral range of 400 to 500 nm to cure the prosthetic part means disposed in the receiving means, said at least one fluorescent tube being disposed to surround the receiving means and irradiate said prosthetic part means to be treated, and

mirror means disposed in said housing for reflecting radiation of said at least one fluorescent tube towards the prosthetic part means, said at least one fluorescent tube in combination with said mirror means being capable of irradiating said prosthetic part means uniformly from all sides.

4,571,666

D.C-D.C. CONVERTER FOR CONVERTING AN UNSTABILIZED D.C.-VOLTAGE TO THREE STABILIZED D.C.-VOLTAGES

Sten V. Nilsson, Askim, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE83/00267, § 371 Date Mar. 6, 1984, § 102(e) Date Mar. 6, 1984, PCT Pub. No. WO84/00449, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 1, 1983, Ser. No. 598,312
Claims priority, application Sweden, Jul. 12, 1982, 8204284
Int. Cl.[4] H02M 3/24
U.S. Cl. 363—15 **3 Claims**

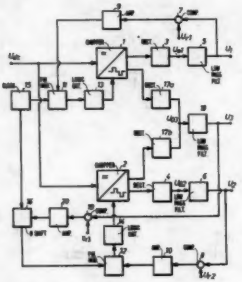
1. A D.C.-D.C. converter for converting an incoming unstablized D.C. voltage (Udc) to at least three stablized output D.C. voltages (U_1, U_2, U_3) and comprising

(a) a first chopper stage, (1) a first pulse width modulator, a first rectifier-filter combination (3,5) coupled to said first chopper stage for forming a first output voltage (U_1) a feed-back loop (7,9,11,13) including a comparator and coupling said rectifier-filter combination to said first pulse width modulator (11) for regulating pulse width in response to comparison in said comparator between the first output voltage and a reference voltage (U_{r1}),

(b) a second chopper stage (2), a second rectifier-filter combination coupled to said second rectifier-filter combination (4,6) for forming a second output voltage (U_2), a second pulse width modulator, a second feed-back loop (8,10,12,14) including a comparator and coupling said

rectifier-filter combination to said second pulse width modulator (12) for regulating pulse width in response to comparison between the second output voltage (U_2) and a second reference voltage (U_{r2}),

(c) a clock circuit (15) coupled to and controlling the first and second pulse width modulators (11,12), logical circuits (13,14) connected to the respective pulse width modulators (11,12), said logical circuits being adapted for controlling first and second chopper stages (1,2) so that the leading edge of the output voltage (Ua) of the first chopper stage and trailing edge of the output voltage (Ub) of the second chopper stage are varied for said regulation



of pulse width, and such that said edges overlap each other, a third rectifier-filter combination, the pulse width modulated output voltages from the first and second chopper stages (1,2) being connected in parallel to said third rectifier-filter combination (17a,17b,18) the output voltage of which forms the third output voltage (U_3) of the converter, and a phase shifting circuit (16) connected between the clock circuit (15) and the second pulse width modulator (12) for varying the phase position between the output voltages from the first and the second chopper stages (1,2) and thereby the third output voltage (U_3) in response to a comparison between the latter said output voltage and a third reference voltage (U_{r3}).

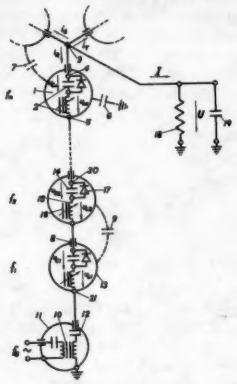
4,571,667

MULTIPHASE AC-DC RESONANT CASCADE POWER CONVERTER

Alex E. Csorsz, 585 Amy La., Idaho Falls, Id. 83401

Filed Aug. 29, 1977, Ser. No. 828,331
Int. Cl.[4] H02H *7/00*
U.S. Cl. 363—51 **8 Claims**

1. RESONANT CASCADE POWER CONVERTER comprising a plurality of Phase Legs, each Phase Leg containing a plurality of Resonant Circuits arranged in cascade so that at least one Variable of AC Excitation in each Phase Leg is



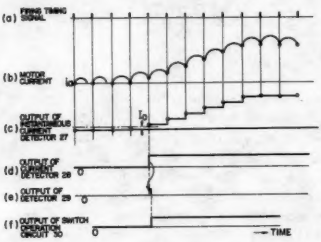
substantially common for all Resonant Circuits of that Phase Leg.

4,571,668

APPARATUS AND METHOD FOR CONTROLLING A THYRISTOR CONVERTER IN RESPONSE TO CHANGE IN MODE OF LOAD CURRENT

Noboru Azusawa, and Hisayoshi Shiraishi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,029
Claims priority, application Japan, Apr. 6, 1983, 58-59274
Int. Cl.[4] H02H *7/162*
U.S. Cl. 363—81 **11 Claims**


(a) FIRING TIMING SIGNAL
(b) MOTOR CURRENT
(c) OUTPUT OF DISCONTINUOUS CURRENT DETECTOR 27
(d) OUTPUT OF CURRENT DETECTOR 28
(e) OUTPUT OF DETECTOR 29
(f) OUTPUT OF SWITCH OPERATING CIRCUIT 30
TIME

1. A control apparatus for a thyristor converter comprising:

a thyristor converter for supplying electric power to a load which generates a changeable electromotive force;

current control means for producing a control angle command value corresponding to a difference between a load current command value and a load current detected value;

control angle calculating means for determining a set control angle for said thyristor converter on the basis of said control angle command value;

compensation control angle producing means for determining a compensation control angle representing a correction value for said set control angle so that said thyristor converter produces the same DC average voltage upon a continuous load current mode and an intermittent load current mode;

means for adding said compensation control angle to said set control angle to apply the added angle to said thyristor converter as a firing control angle;

intermittent/continuous current detecting means for delivering an output signal when detecting that said load current

is changed from the intermittent load current mode to the continuous load current mode; and

main circuit constant calculating means for calculating an actual main circuit constant in response to said output signal from said intermittent/continuous current detecting means on the basis of a pregiven main circuit constant of said load, a predetermined minimum value of a DC average motor current at which said compensation control angle is zero, a DC average load current and the set control angle at a time when the load current just changed from said intermittent load current mode to said continuous load current mode, wherein

said compensation control angle producing means obtains the compensation control angle on the basis of the calculated actual main circuit constant and said DC average load current.

4,571,669
TRANSFORMER WITH RECTIFIER

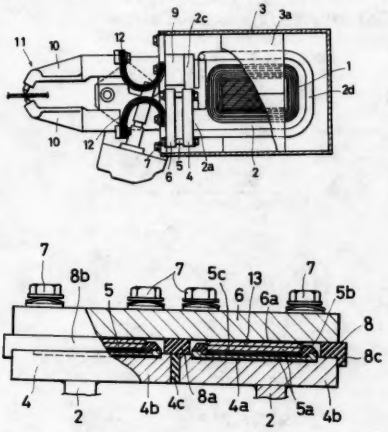
Gen Tsujii, and Takashi Yanagisawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1984, Ser. No. 590,383

Claims priority, application Japan, Sep. 13, 1983, 58-140867[U]

Int. Cl.⁴ H02M *1/00*

U.S. Cl. 363—144 **12 Claims**



1. A transformer and rectifier in combination, said combination comprising:

a transformer main body;

a primary coil mounted on said main body;

a secondary coil mounted on said main body and being operatively connected with said primary coil;

a secondary electrode plate having front and rear surfaces and being connected on its rear surface to said secondary coil and disposed at a front surface of said main body;

a terminal plate;

a rectifier providing a connection between said terminal plate and the front surface of said secondary electrode, said rectifier having semiconductor means for rectifying electrical current including,

a semiconductor layer having front and rear holding plates, and

a circumferential seal ring surrounding said holding plates;

means for fastening said terminal plate and said secondary electrode plate together, said terminal plate and said secondary electrode plate having plated metallic layers facing each other and in contact with said semiconductor means held therebetween; and

a frame seal member surrounding said semiconductor means and held between said terminal plate and said secondary electrode plate.

4,571,670
NC PROGRAMMING APPARATUS

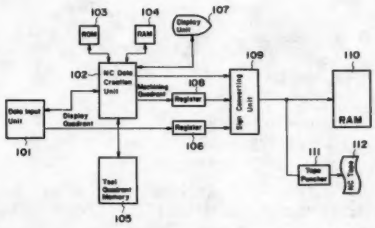
Hajimu Kishi, Hino, and Kunio Tanaka, Akishima, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Aug. 23, 1983, Ser. No. 525,669

Claims priority, application Japan, Aug. 23, 1982, 57-145836

Int. Cl.⁴ G06F *15/46*; G05B *19/18*

U.S. Cl. 364—171 **7 Claims**



3. A numerical control programming apparatus for creating a numerical control program which controls machining of a workpiece by tools in multiple quadrants, said apparatus comprising:

data creation means for specifying a machining quadrant and a tool path for each of the tools, and a single display quadrant for all of the tools; and

converting means, operatively connected to said data creation means, for converting the tool path specified by said data creation means into at least one item of numerical control data for controlling the machining performed by the tools and into display data for displaying the tool path in the single display quadrant.

4,571,671
DATA PROCESSOR HAVING MULTIPLE-BUFFER ADAPTER BETWEEN A SYSTEM CHANNEL AND AN INPUT/OUTPUT BUS

Charles S. Burns, Mazeppa; Michael R. Crabtree, Rochester; Dwight A. Gourneau, Rochester; Scott W. Hinkel, Rochester, all of Minn.; George A. Lerom, and Michael J. Mayfield, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1983, Ser. No. 494,250

Int. Cl.⁴ G06F *3/00*

U.S. Cl. 364—200 **11 Claims**

1. A data-processing system, comprising:

a processing engine;

a system channel coupled to said processing engine and adapted to transfer an entire block of data units in a single burst;

a plurality of input/output devices;

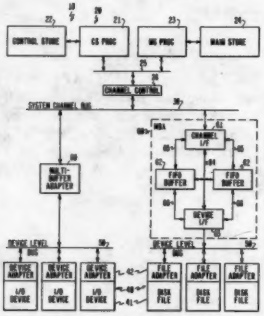
a device-level bus coupled to said devices and adapted to transfer interleaved single data units from more than one of said devices at a time; and

a multi-buffer adapter coupled to said system channel and to said device-level bus, said adapter including

a plurality of first-in/first-out buffers each adapted to hold at least one of said blocks of data units,

a channel interface responsive to said system channel for selectively coupling said buffers to said system channel long enough to transfer said entire block of data units between said channel and one of said buffers, and

a device-level bus interface for sequentially coupling each of said buffers to said device-level bus long enough to



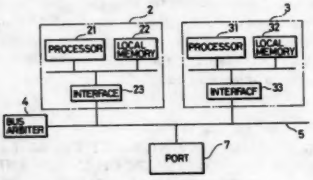
transfer an individual one of said data units between said device-level bus and a different one of said devices.

4,571,672

ACCESS CONTROL METHOD FOR MULTIPROCESSOR SYSTEMS

Minoru Hatada, Ebina; Hideaki Ishida, and Masatoshi Matsushita, both of Kawasaki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Micro Computer Engineering Ltd., both of Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,038
Claims priority, application Japan, Dec. 17, 1982, 221684
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **2 Claims**



1. In a multiprocessor system wherein a plurality of processors and a common memory are connected to a common bus; an access control method for a multiprocessor system characterized in that a data transferring port into which data can be written only when said port is unoccupied and from which data can be read only when the data is stored in said port is provided as said common memory, and that in accesing said port from the respective processors, writing data double and reading the same data twice are prevented and also an exclusion control is performed by an operation of said port itself.

4,571,673

ENHANCED CPU MICROBRANCHING ARCHITECTURE

Robert W. Horst, Cupertino, and Richard L. Harris, San Jose, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Sep. 29, 1983, Ser. No. 537,886
Int. Cl.[4] G06F *9/38, 9/42*
U.S. Cl. 364—200 **1 Claim**

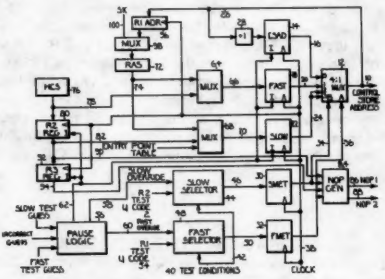
1. Hardware for performing microbranching in a central processing unit of a data processing system including:

means for holding a first address for the next sequential microinstruction to be executed;

means for holding a second address for a fast microbranch;

means for holding a third address for a slow microbranch;

selection means for selecting one of said first, second and third addresses, and placing it on a control store address bus;



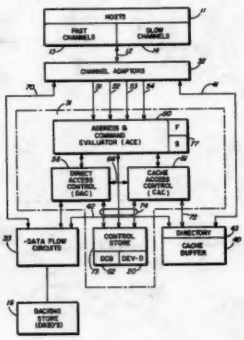
means for controlling said selection means in response to test conditions selected by microcode.

4,571,674

PERIPHERAL STORAGE SYSTEM HAVING MULTIPLE DATA TRANSFER RATES

Michael H. Hartung, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,962
Int. Cl.[4] G06F *12/08*
U.S. Cl. 364—200 **86 Claims**



1. A peripheral data-storage system having a caching data buffer connected to a backing data store with a given minimal data-transfer rate, means for transferring data between said caching data buffer and said backing store, means for connecting said data-storage system to a plurality of peripheral channels, some of said peripheral channels being fast channels with maximal data-transfer rates of not less than said given data-transfer rate and others of said peripheral channels being slow channels having maximal data-transfer rates less than said given data-transfer rate; system control means coupled to said connecting means, said caching buffer and said backing data store, means in said control means for receiving operation-mode-indicating signals from said connecting means which indicate respective given desired modes of operation relating to usage of said caching buffer during ensuing data transfers between said channels and said data-storage system, said data buffer having a plurality of allocatable and addressable data-storage areas;

fast-control means in said system control means and being responsive to said mode-indicating signals and to said ensu-

ing data transfers with a fast one of said channels to remove data from and limit data transfers to said caching buffer in accordance with said ensuing data transfers and said operation-mode-indicating signals;

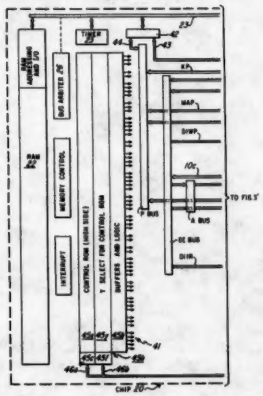
buffer-data replacement-control means in said system control means for keeping an LRU list in accordance with data transfers between any of said channels and said caching buffer such that one end of the LRU list identifies data stored in said data buffer that is most-recently used while the other end of said LRU list identifies data stored in said data buffer that is least-recently used and having means for transferring data between said caching buffer and said backing store in accordance with said LRU list, said operation-mode-indicating signals and said ensuing data transfers; and

slow-control means in said system control means for being responsive to said ensuing data transfers with a slow one of said channels to require all of said slow-channel-related data transfers to include said caching buffer and being further responsive to said operation-mode-indicating signals and said slow-channel-related ensuing data transfers to adjust said LRU list in accordance with said operation-mode-indicating signals and said slow-channel-related ensuing data transfers whereby even when said operation-mode-indicating signals indicate reduced desired usage of said caching buffer data occupancy in said caching buffer for fast-channel ensuing data transfers and for slow-channel ensuing data transfers that replacement of data from said caching buffer is adjusted in accordance with said operation-mode-indicating signals for all of said channels.

4,571,675
MICROPROCESSOR DEVICE WITH INTEGRATED AUTO-LOADED TIMER

Mark A. Stambaugh; Stephen P. Sacarisen, and Michael W. Patrick, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1984, Ser. No. 567,599
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **19 Claims**



1. A microprocessor device formed in a single semiconductor body, comprising:

a CPU including an ALU, a plurality of registers, input/output port means, an instruction register, a control ROM having an input coupled to the instruction register, internal CPU bus means interconnecting inputs and outputs of the ALU with said registers and said input/output port means, and interrupt means for the CPU,

input/output terminals on said semiconductor body,

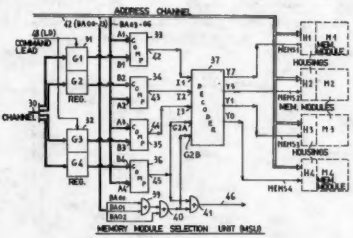
a timer having a clock input, a latch register and a count register, the timer having an output coupled to said interrupt means of the CPU, and a control register for the timer, said count register being decremented by said clock input, and means for reloading said count register from said latch register when said counter register has decremented to zero,

address/data bus means coupling said input/output port means of the CPU with said latch register and said control register of said timer, and with said input/output terminals.

4,571,676
MEMORY MODULE SELECTION AND RECONFIGURATION APPARATUS IN A DATA PROCESSING SYSTEM

Calogero Mantellina, Cerro Maggiore; Daniele Zanzottera, Busto Garolfo, and Marco Gelmetti, Milano, all of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Sep. 24, 1982, Ser. No. 422,772
Claims priority, application Italy, Nov. 24, 1981, 25266 A/81
Int. Cl.[4] G06F *13/00, 12/00*
U.S. Cl. 364—200 **2 Claims**



1. A memory module selection and reconfiguration apparatus for a data processing system, said data processing system comprising a central unit and a modular working memory connected to said central unit by a communication bus including data and address lines, said working memory including a memory control unit, a plurality of n ordered housings each for housing a memory module with memory capacity equal to or multiple of a minimum capacity, and at least a memory module in one of said housings, said memory module selection and reconfiguration apparatus comprising:

first means in each of the modules for generating a plurality of first binary codes, one code for each module, each of said first codes being representative of the memory capacity of the generating module;

second means in said memory control unit for receiving said first binary codes and for transferring to said central unit said first binary codes through said communication bus, responsive to commands from said central unit;

third means in said memory control unit for receiving from said central unit and through said bus memory addresses and second binary codes, one code for each memory housing, each of said second codes being representative of the cumulative memory capacity of the modules installed in the related housing and into the preceding ordered housings;

a memory module selector in said memory having

(a) inputs connected to said third means for receiving said second binary codes and addresses on a predetermined portion of said memory address lines,

(b) a plurality of registers, one register for each memory housing irrespective of the presence or absence of memory module in the housing, each for storing one of said second binary codes,

(c) a plurality of comparators, one and only one comparator for each memory housing irrespective of the pres-

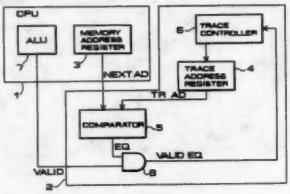
ence or absence of the memory module in the housing, each of said comparators receiving as input said predetermined portion of said memory address lines and the second binary code related to the corresponding memory housing, each of said comparators providing as output a binary signal indicative of the comparison performed between the second binary code and said memory address portion received as input, and

(d) a decoder provided with inputs for receiving said binary signal from each of said comparators and with a plurality of outputs, each of said outputs being coupled to a memory housing, said decoder providing on a selected one of said outputs and in response to said binary signals received from said comparator a module selection signal, said module selection signal being received by a selection input of the module installed into the related housing.

4,571,677
TRACING SYSTEM

Mitsunori Hirayama, and Kimio Yamanaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,490
Claims priority, application Japan, Nov. 18, 1981, 56-186008
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—200 **2 Claims**



1. A tracing system wherein a central processing unit compares contents of a memory address register holding an address corresponding to the instruction to be executed in the next execution stage with a trace address which has previously been set to detect coincidence of the trace address by means of the coincidence of said contents of the memory address register and said trace address, said system comprising a trace register holding said trace address which has previously been set; a comparator connected to said trace address register and to said memory address register for comparing the trace address set in said trace address register with the address set in said memory address register to output a coincident signal in the case where said trace address coincides with said memory address; and an AND circuit for receiving the coincident signal derived from said comparator and a valid signal sent from an arithmetic and logic circuit of said central processing unit in the case when the address corresponding to the instruction to be executed in the next execution stage in said central processing unit is held in said memory address register.

4,571,678
REGISTER ALLOCATION AND SPILLING VIA GRAPH COLORING

Gregory J. Chaitin, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

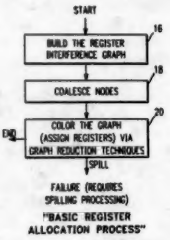
Filed Nov. 5, 1982, Ser. No. 439,523
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—300 **12 Claims**

1. In an optimizing compiler for converting a high level source language program into a machine executable program, the improvement which comprises a register allocation procedure which receives as input an intermediate language specifying storage requirements for the program as an unlimited number of symbolic registers and which produces a modified intermediate language for the program wherein all symbolic register assignments are converted to real machine registers or storage designations, said procedure comprising the steps of:

generating an interference graph for said program,

allocating registers to said program via graph reduction and graph coloring techniques without spilling,

when it is determined that further graph reduction is blocked



and that spilling must occur, removing any remaining nodes in the interference graph by either making a spill determination or by further graph reduction steps until the graph is completely reduced,

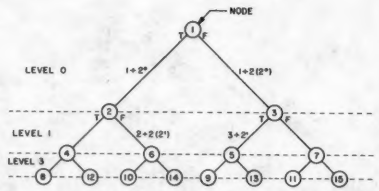
generating spill code for those nodes removed on the basis of spill determinations, and

assigning registers to the nodes of said reduced graph by graph coloring techniques.

4,571,679
FAULT TREE DATA ARRAY

William R. Russell, late of Baltimore, Md., and Samuel G. Russell, executor, Landenberg, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 6, 1983, Ser. No. 529,465
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—300 **1 Claim**



1. A method for use in computer controlled detection and indication of a malfunction in a system, said method comprising the steps of:

providing a plural level fault tree wherein alternative true and false decisions are arranged as information nodes of a data array to be examined in a sequence to lead to a conclusion;

examining nodes in a predetermined first path for true (T) or false (F) status;

examining subsequent nodes in accordance with the expressions

$$A(T)_{n+1}=A_n+2^L \text{ for true results}$$

$$A(F)_{n+1}=A_n+2(2^L) \text{ for false results}$$

where A=node number, L=tree level, and n=present node being examined, until a conclusion is reached.

4,571,680

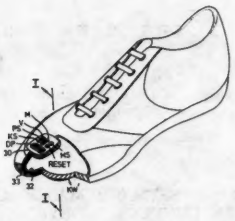
ELECTRONIC MUSIC PACE-COUNTING SHOE

Chyuan-Jong Wu, No. 15, Lane 41, Ta-Tung Rd., Fei-Sha Tsun, Su-Hu Hsiang, Yun-Lin Hsien, Taiwan

Continuation-in-part of Ser. No. 267,630, May 27, 1981, Pat. No. 4,401,247. This application May 18, 1982, Ser. No. 379,346

Int. Cl.[4] A43B *5/00;* G01C *22/00;* G10H *1/00*

U.S. Cl. 364—410 26 Claims



1. Apparatus adapted for disposition on a shoe, comprising:

a switch device for generating a pace signal in response to each pace taken by said shoe; and

an electronic device responsive to said pace signals for generating pace count indicative of paces taken with said shoe, said electronic device comprising:

means for storing indicia of a predetermined number of paces;

means for comparing said pace count to said stored number of paces, and generating alarm signals when a predetermined relationship exists between said pace count and said stored number of paces, said alarms signals including musical notes having a tempo corresponding to a tempo of paces taken by said shoe; and

a display device for providing indicia of said count.

4,571,681

SWITCHING ARRANGEMENT FOR THE CONTROL OF THE CONTROL ELEMENTS OF A DENTAL TREATMENT LOCATION

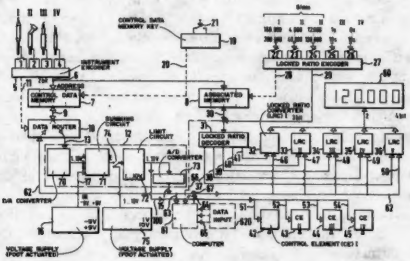
Stefan Beier, Biberach an der Riss, and Hermann Gmeinder, Warthausen-Oberhofen, both of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,628

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302389

Int. Cl.[4] G06F *15/42;* A61C *1/02*

U.S. Cl. 364—413 7 Claims



1. In a switching arrangement for the control of treatment instruments through the control elements associated with a dental treatment location, including a control data storage having control data constants stored therein for the treatment instruments through the control elements associated with a central treatment location, a control component for retrieving control data constants for the setting of a currently utilized control element, and a first voltage output means transmitting voltages to the control component for varying control data transmitted thereto from the control data memory; the improvement comprising a second voltage output means connected with the control component which provides a variable voltage between an initial value from zero and upon the actuation of which there is prevented the receipt or discharge of signals from the control data memory and of voltages from the first voltage output means through the control component.

4,571,682

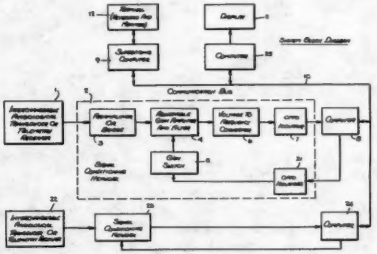
SYSTEM AND METHOD FOR SKILL ENHANCEMENT AND BEHAVIOR MODIFICATION

Gordon Silverman, and Joseph Brudny, both of New York, N.Y., assignors to Computerized Sports Equipment, Inc., New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,165

Int. Cl.[4] G06F *15/42, 15/16*

U.S. Cl. 364—413 14 Claims



1. A training device for selectively monitoring one or more of a plurality of physiological signals produced by a human being and for displaying computed measures of such signals including:

(a) a plurality of replaceable, selectable and interchangeable transducer means adapted to be singly and plurally utilized for conversion of said plurality of physiological signals into a corresponding plurality of equivalent electrical signals;

(b) a plurality of corresponding signal conditioning means for said equivalent electrical signals including adjustable electrical amplification means, filtering means and conversion means adapted to convert said plurality of said conditioned equivalent electrical signals into a corresponding plurality of equivalent equipotential pulse trains, each of whose instantaneous frequencies is proportional to each of said corresponding plurality of said conditioned equivalent electrical signals;

(c) a plurality of display means operative for presentation of said plurality of equivalent equipotential pulse trains as computed measures of said physiological signals;

(d) terminal means for control of said training device by the said human being;

(e) a plurality of relatively independent computer means cooperating in selective combinations and at least one combination of which is adapted to calculate said computed measures of said corresponding plurality of equivalent equipotential puise trains, and another combination of which is adapted to control at least one of said plurality of display means;

(f) supervising computer means adapted to control, select and/or coordinate said plurality of said relatively independent computer means; and

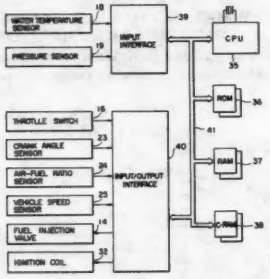
(g) communication bus means adapted to transmit information between said plurality of relatively independent computer means and said supervising computer means.

4,571,683

LEARNING CONTROL SYSTEM OF AIR-FUEL RATIO IN ELECTRONIC CONTROL ENGINE

Nobuyuki Kobayashi, Toyota; Toshiaki Isobe, Nagoya; Nobuhisa Ohkawa, and Takahide Kuma, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1982, Ser. No. 403,042
Claims priority, application Japan, Mar. 3, 1982, 57-32308
Int. Cl.[4] G06F *7/76, 15/48, 15/50;* **G06G** *7/70*
U.S. Cl. 364—431.05 **7 Claims**



1. A system for learning control of the air-fuel ratio in an electronically controlled engine comprising:

means for generating an indication of engine load;

means for generating a ratio signal indicative of air-fuel ratio by monitoring exhaust gases of said engine; and

processing means for: (1) determining a basic fuel injection amount, TP, as a predetermined function of engine load, (2) determining a final fuel injection amount, TAU, in accordance with $TAU=AxTP+B+J$ wherein A is a first learning term, B is a second learning term and J is a correction amount, (3) correcting said first learning term A in response to said ratio signal when said engine has a load larger than a predetermined value, and (4) correcting said second learning term B in response to said ratio signal when said engine has a load smaller than said predetermined value.

4,571,684

MAP DISPLAY SYSTEM FOR VEHICLES

Kazunori Takanabe, Kasugai; Masaki Yamamoto, Nagoya; Kenzo Ito, Okazaki, and Hiroshi Fujinami, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 23, 1984, Ser. No. 592,842
Claims priority, application Japan, Mar. 25, 1983, 58-49956
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **6 Claims**

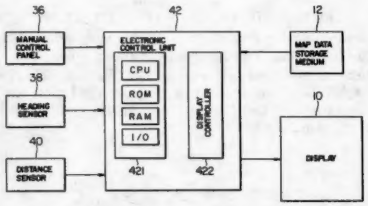
1. A map display for vehicle in which in response to movement of a vehicle, a present position of the vehicle is successively computed to display the same on a map displayed on a display screen, said system comprising:

a map data storage medium for preliminarily storing a plurality of spot coordinates representing map forming spots with a specified spot as a coordinate origin;

storage means for preliminarily storing map changing frame indicative of display coordinates;

means for comparing display coordinates of said present position with display coordinates of map changing frame;

means for extracting spot coordinates to form a new map centering said present position from said map data storage medium by comparing spot coordinates of said present position with the spot coordinates in said map data storage medium in response to a decision of said comparing means that said present position has reached said map changing frame; and



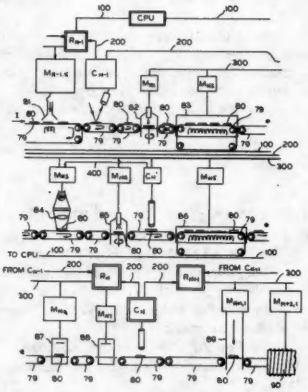
means for displaying said new map on display according to spot coordinates extracted by said extracting means.

4,571,685

PRODUCTION SYSTEM FOR MANUFACTURING SEMICONDUCTOR DEVICES

Mototaka Kamoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,677
Claims priority, application Japan, Jun. 23, 1982, 57-107802; Aug. 12, 1982, 57-140253
Int. Cl.[4] G06F *15/46;* **G05B** *13/02;* **G06G** *7/64;* **H01L** *21/66*
U.S. Cl. 364—468 **3 Claims**



1. A method of manufacturing semiconductor devices in a production line having a first manufacturing apparatus; a second manufacturing apparatus; an inspection apparatus located between said first and second manufacturing apparatus; a first transfer means located between said first masnufacturing apparatus and said inspection apparatus; a second transfer means located between said inspection apparatus and said second manufacturing apparatus; a control unit coupled to said inspection apparatus and said second manufacturing apparatus, said control units storing therein a specification range and a central range within said specification range; said method comprising the steps of

automatically carrying out a first process step on a semiconductor wafer in said first manufacturing apparatus to form a feature in said semiconductor wafer;

automatically transferring said semiconductor wafer from said first manufacturing apparatus to said inspection apparatus by use of said first transfer means;

automatically inspecting said feature in said semiconductor which is formed by said first manufacturing apparatus;

sending a first information signal indicating an inspected value of said feature to said control unit;

estimating said inspected value in said control unit to determine whether said inspected value is outside said specification range, within said specification range but outside said central value, or within both said specification and central values;

sending a second information signal from said control unit to said second manufacturing apparatus when said inspected value is within said specification range, but outside said central range;

automatically transferring said semiconductor wafer from said inspection apparatus to said second manufacturing apparatus by use of said second transfer means when said inspected value is within both said specification and central ranges or within said specification range, but outside said central range; and

automatically carrying out a second process step on said semiconductor wafer in said second manufacturing apparatus under a first condition when said inspected value of said semiconductor wafer is within both specification and central ranges and under a second condition when said inspected value of said semiconductor wafer is within said specification range, but outside said central range; said second condition being changed from said first condition by said second information to compensate a deviation from said central range.

4,571,686

TRACK MONITORING SYSTEM FOR A CUTTER TIP OF A TOOL POST IN MACHINE TOOLS

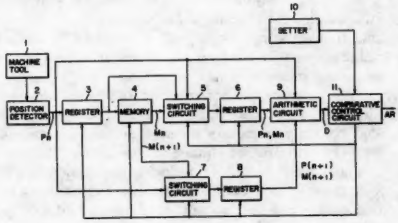
Yoshio Torisawa, Kasugai, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Nagoya, Japan

Filed Jan. 10, 1983, Ser. No. 456,724

Claims priority, application Japan, Mar. 5, 1982, 57-34930

Int. Cl.[4] G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474 **3 Claims**



1. A track monitoring apparatus for a cutter tip of a tool post mounted on a machine tool, comprising:

a position detector for detecting the position of the cutter tip of the tool post;

a first register for storing position data outputted from said position detector;

a memory for storing data output from said first register;

a second register for storing said position data from said position detector and said output data from said first register and first output data from said memory which is input thereto through a first switch circuit;

a third register for storing said position data from said position detector and second output data from said memory which is input thereto through a second switch circuit;

an arithmetic circuit for receiving said position data and output data from said second register and output data from said third register and for calculating a distance between a predetermined linear line and a present position;

a setter for setting a predetermined tolerance distance for positional deviation; and

a comparative control circuit which controls said first through third registers as well as said first and second switch circuits and which outputs an alarm signal when said calculated distance is greater than said predetermined tolerance distance.

4,571,687

SCREW CUTTING CONTROL SYSTEM

Hiroomi Fukuyama, Hachioji, and Shinichi Isobe, Hino, both of Japan, assignors to Fujitsu Fanuc Limited, Minamitsuru, Japan

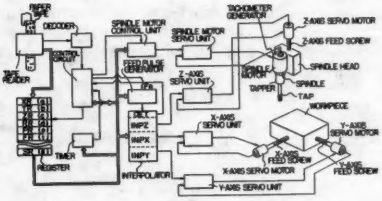
PCT No. PCT/JP81/00288, § 371 Date Jun. 14, 1982, § 102(e) Date Jun. 14, 1982, PCT Pub. No. WO82/01336, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 16, 1981, Ser. No. 395,081

Claims priority, application Japan, Oct. 17, 1980, 55-145128

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—475 **8 Claims**



2. A screw cutting control system for a numerically-controlled machine tool using a tap to cut a screw in a workpiece, comprising:

a numerical controller for generating drive commands;

a machine tool, operatively connected to said numerical controller, comprising:

a spindle;

a spindle motor, connected to said spindle and operatively connected to said numerical controller, for rotating said spindle in forward and reverse directions; and

a tapper, engageable with said spindle, for holding the tap while permitting axial movement between the tap and said spindle, transmitting the forward rotation of said spindle to the tap only within a predetermined range of axial movement of the tap away from said spindle and transmitting the reverse rotation of said spindle to the tap; and

feed motors, operatively connected to said numerical controller and connected to at least one of the workpiece and said spindle, for moving said spindle and the workpiece relative to each other along the axis of said spindle and along an axis independent of the axis of said spindle.

4,571,688

WIRE BONDING APPARATUS

Tomio Kashihara, Yokohama, and Katsuhiko Aoyagi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 15, 1983, Ser. No. 532,513

Claims priority, application Japan, Sep. 16, 1982, 57-161213

Int. Cl.[4] G06G *7/64*; B23K *1/06, 5/00*

U.S. Cl. 364—477 **9 Claims**

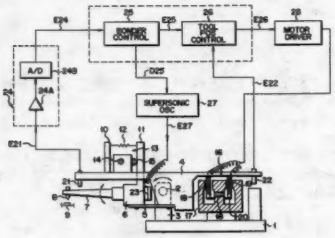
1. A wire bonding apparatus comprising:

tool means for carrying a wire having a bonding ball at an end portion of said wire and for transferring said bonding ball to a bonding target;

supersonic means coupled to said tool means for supplying said bonding ball with supersonic vibration energy;

detector means coupled to said tool means and responsive to a force produced between said bonding ball and said bonding target when said bonding ball contacts said bonding target for generating a contact signal corresponding to said force; and

bonding control means, coupled to said detector means and said supersonic means, for defining said supersonic vibration energy, in accordance with a change in a level of said contact signal.

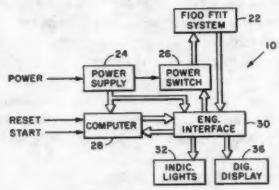


4,571,689

MULTIPLE THERMOCOUPLE TESTING DEVICE

James R. Hildebrand, Palm Beach Gardens, and Kurt J. Sobanski, North Palm Beach, both of Fla., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 20, 1982, Ser. No. 435,515
Int. Cl.[4] G01R *31/02*
U.S. Cl. 364—481 **10 Claims**



9. A method of determining electrical continuity of a plurality of thermocouple probes, each of said probes having a first thermocouple and a second thermocouple, said second thermocouples are connected in parallel groups, said method comprising the steps of:

applying sequentially current to said first thermocouples;

allowing sufficient time for said second thermocouple, located in said probe with said first thermocouple that sequentially received current, to heat;

measuring the output of said group having said heated second thermocouple therein; and

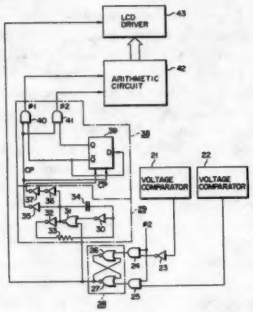
determining the continuity of said probes.

4,571,690

ARITHMETIC OPERATION APPARATUS USING SOLAR CELLS

Eiichi Munetsugu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1983, Ser. No. 480,003
Claims priority, application Japan, Mar. 30, 1982, 57-52024
Int. Cl.[4] G06F *15/02*
U.S. Cl. 364—483 **3 Claims**



1. An arithmetic operation apparatus using solar cells as a power source, comprising:

capacitor means, connected to said solar cells, for smoothing the power output of said solar cells;

arithmetic operating means, connected to said capacitor means to receive a voltage generated by said solar cells as a power source voltage, for executing various types of operations;

clock signal generating means for generating clock signals to be used as synchronization signals in said arithmetic operating means;

voltage comparator means for compairing said power source voltage with a first set voltage and with a second set voltage, the absolute value of said first set voltage being smaller than the absolute value of said second set voltage, said first set voltage being set to be close to a minimum value above which erroneous operation of said arithmetic operating means will not occur; and

controlling means for interrupting the generation of said clock signals by said clock signal generating means when said voltage comparator means determines a coincidence between said first set voltage and said power source voltage, and for restarting said clock signal generating means when said voltage comparator means determines a coincidence between said second set voltage and said power source voltage after a clock signal interruption.

4,571,691

WATT-HOUR METER WITH FIBER OPTICS TAMPER DETECTOR

Jerry M. Kennon, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1983, Ser. No. 466,808
Int. Cl.[4] G08B *21/00*; G01R *21/06*
U.S. Cl. 364—483 **11 Claims**

1. Apparatus for indicating the occurrence of tampering with an electrical energy meter installation, the apparatus comprising:

watt-hour meter means having a protective cover;

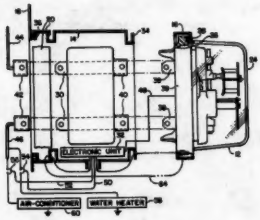
mounting means for receiving the meter means and for electrically connecting the meter means to an associated electrical circuit being monitored;

means for securing the protective cover to the mounting means;

a fiber optic link connected to the securing means such that

operation of the securing means sufficient to permit relative movement between the cover and the mounting means is operative to cause severance of the fiber optic link;

electronic means electrically connected to the meter means for performing energy measurement and control functions in association with the meter means; and



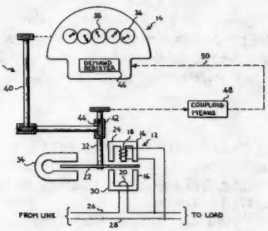
the electronic means having an input terminal connected to the fiber optic link such that severance of the link generates a signal within the electronic means to indicate the occurrence of tampering said signal being retainable within said apparatus.

4,571,692

ELECTRONIC DEMAND REGISTER

Warren R. Germer, Dover, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,684
Int. Cl.[4] G01R *19/16*; G06F *15/20*
U.S. Cl. 364—483 **7 Claims**



1. A demand register for an electric meter comprising:

a processor;

means in said processor for calculating a rolling demand including means for summing a demand in a subinterval with demands in a preceding N-1 subintervals to derive an interval demand over N contiguous subintervals;

means for storing a maximum demand;

means for replacing said maximum demand with said interval demand if said interval demand exceeds said maximum demand;

said processor including a volatile memory;

a non-volatile memory;

means responsive to a predetermined reduction in a voltage fed to said electric meter for enabling a first transfer of at least said maximum demand, a value representing a time at which a subinterval is interrupted by said predetermined reduction in said voltage and a plurality of programmed constants from said volatile memory to said non-volatile memory;

means responsive to a predetermined restoration in a voltage fed to said electric meter for enabling a second transfer of said maximum demand, said value and said plurality of constants from said non-volatile memory to said volatile memory; and

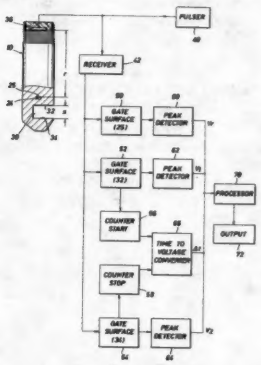
means for resuming operation of said demand register following said second transfer at a time in a first subinterval corresponding to a time represented by said value.

4,571,693

ACOUSTIC DEVICE FOR MEASURING FLUID PROPERTIES

James R. Birchak, Spring, and Edward A. Lygas, Houston, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,811
Int. Cl.[4] G01T *1/16*
U.S. Cl. 364—509 **21 Claims**



1. A device suitable for use in an apparatus for measuring fluid characteristics, comprising:

a solid probe;

means in contact with said probe for transmitting and receiving ultrasonic signals through said probe;

means within said probe for contacting a fluid whose characteristics are to be measured with first and second surfaces on said probe capable of reflecting a portion of said ultrasonic signals to produce measurable reflected signals at said receiving means; and

means within said probe for providing a reference signal by reflecting a portion of said ultrasonic signals, said reference reflector means located between said transmitting-/receiving means and said fluid contacting means.

4,571,694

ROBOT CONTROL SYSTEM

Hajimu Inaba; Shinsuke Sakakibara, and Ryo Nihei, all of Tokyo, Japan, assignors to Fanuc Limited, Minamitsuru, Japan

PCT No. PCT/JP81/00384, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02438, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 16, 1981, Ser. No. 414,366
Claims priority, application Japan, Dec. 30, 1980, 55-186749
Int. Cl.[4] G05B *19/00*; B25J *9/00, 13/00*
U.S. Cl. 364—513 **3 Claims**

1. A robot control system for moving a robot relative to a workpiece, comprising:

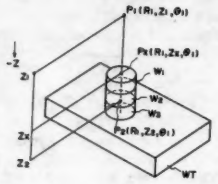
a robot controller operatively connected to the robot;

a pulse distributor, operatively connected to said robot controller, for producing distribution pulses;

a servo circuit, operatively connected to said pulse distributor and the robot, for producing a movement signal;

a sensor, operatively connected to said robot controller, said pulse distributor and said servo circuit, for generating a

stopping signal when the robot reaches a predetermined position relative to the workpiece, said pulse distributor

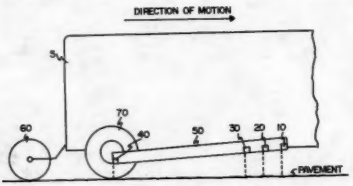


and said servo circuit discontinuing the production of the distribution pulses and the movement signal, respectively, when the position signal is generated.

4,571,695
NON-CONTACT ROAD PROFILOMETER AND DEFLECTION METER

David J. Elton, and Milton E. Harr, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jul. 9, 1982, Ser. No. 396,618
Int. Cl.[4] G01B *3/18, 5/00*
U.S. Cl. 364—550 **11 Claims**



1. An apparatus for continuously measuring a road surface profile, the apparatus comprising

a rigid frame attached to a vehicle,

first, second, and third profile detecting means, serially mounted on the rigid frame in spaced-apart relation, for measuring a distance between a selected datum line on the frame and the underlying road surface,

control means for simultaneously instructing the first, second, and third profile detecting means to activate to cause the distance to be simultaneously measured between the selected frame datum and the underlying road surface at three laterally spaced-apart locations to provide a set of distance data,

sequencing means for periodically activating the control means,

data collection means for sequentially recording a plurality of the sets of distance data periodically measured by the first, second, and third profile detecting means, and

computer means for manipulating each of the sets of distance data recorded by the data collection means to mathematically compute the profile of the underlying road surface.

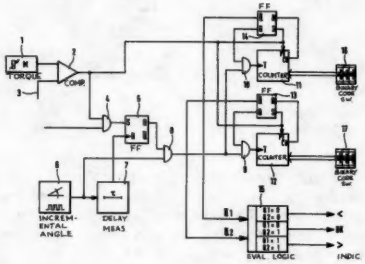
4,571,696
ELECTRONICALLY CONTROLLED SCREWDRIVER WITH QUALITY CHECK INDICATOR

Rainer Bitzer, Weissach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,272
Claims priority, application Fed. Rep. of Germany, May 19, 1982, 3218928
Int. Cl.[4] B25B *23/14;* G06G *7/48*
U.S. Cl. 364—552 **7 Claims**

1. Electronically controlled power-screwdriver equipment including a motor energized by a power circuit and having a screwdriver shaft, an angle-of-turn transducer for producing pulses at successive equal increments of angle of rotation of said shaft, a torque transducer for producing an electric signal representative of torque applied to said shaft, a triggering circuit for producing a trigger signal when a first predetermined value of torque applied by said shaft is reached, and means for stopping said shaft by a process that allows a brief interval of shaft deceleration in the stopping of said shaft following a trigger signal from said triggering circuit, said power-screwdriver equipment further comprising:

means responsive to said torque transducer for producing a



count start signal when a second predetermined value of torque applied by said shaft is reached;

first and second counters connected to start counting from predetermined initial count states in response to said count start signal, in step with said pulses produced by said angle-of-turn transducer;

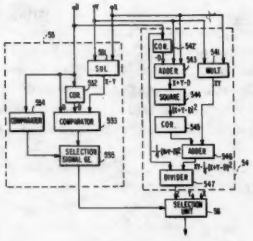
means for detecting a predetermined stage of said shaft deceleration following said trigger signal, and

means for storing and displaying signals indicative of whether predetermined values of count have respectively been reached in said counters at an instant of time at which said stage of said shaft deceleration is detected.

4,571,697
APPARATUS FOR CALCULATING PATTERN DISSIMILARITY BETWEEN PATTERNS

Takao Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,867
Claims priority, application Japan, Dec. 29, 1981, 56-210200
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—561 **4 Claims**



2. An apparatus for determining a dissimilarity measure between a first pattern A and a second pattern B by adopting a distance between a line segment connecting two adjacent vectors of said first pattern A and one vector of said second pattern B, said first pattern A being given in the form of a first time sequence of vectors $\{a_1, a_2, \cdots, a_i, \cdots, a_I\}$ and said

second pattern B being given in the form of a second time sequence of vectors $\{b_1, b_2, \cdots, b_j, \cdots b_j\}$ said apparatus comprising:

first memory means for storing said first pattern, including said two adjacent vectors;

second memory means for storing said second pattern; and

calculating means, responsive to said first and second patterns stored in said first and second memory means, respectively, for calculating said distance, said calculating means comprising;

first means for calculating a distance $D(=d(a_{i+1}, a_i))$ between two adjacent vectors a_{i+1} and a_i of said first time sequence in a vector space;

second means for calculating a distance $X(=d(a_{i+1}, b_j))$ between said vector a_{i+1} of said first time sequence and one vector b_j of said second time sequence in the vector space, and for calculating a distance $Y(=d(a_i, b_j))$ between said vector a_i of said first time sequence and said one vector b_j of said second time sequence;

third means for calculating said distance between said line segment connecting said two adjacent vectors of said first pattern A and said one vector of said second pattern B by calculating $Z(=(XY-\frac{1}{2}(X+Y-D)^2/D)$ in response to said distances D, X and Y to thereby determine a dissimilarity between said first and second patterns; and

means for selecting one of said distances X, Y and Z, wherein said selecting means selects said distance X when $D=0$, said distance Z when $D\neq 0$ and $-D\leqq X-Y\leqq D$, said distance X when $D\neq 0$ and $X-Y<-D$, and said distance Y when $D\neq 0$ and $X-Y>D$.

4,571,698

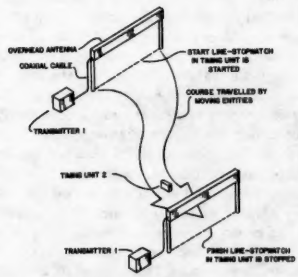
APPARATUS AND SYSTEM FOR REMOTE TIMING OF PLURAL ENTITIES

Orin R. Armstrong, 2013 N. Potomac St., Arlington, Va. 22205

Filed Nov. 29, 1982, Ser. No. 444,950

Int. Cl.[4] G04F *10/00*

U.S. Cl. 364—569 **4 Claims**



1. A method for timing the elapsed time of an event for a plurality of entities by using a system comprised of first transmitting means located at a first location for transmitting a first activating signal within a predetermined limited distance, second transmitting means located at a second location for transmitting a second activating signal within a predetermined limited distance, a plurality of timing means for being carried respectively by individual ones of a plurality of entities, each timing means consisting essentially of stopwatch means for timing the start and finish of an event, receiving means for receiving said first and second activating signals from said first and second transmitting means for respectively starting and stopping said stopwatch means, and memory means for storing the time clocked by said stopwatch means, said memory means having an output, and the system further comprising read-out and processing means separate from said plurality of timing means for having each one of said timing means individually connected thereto at said memory means output for providing a read-out of the time stored in said memory means of the individual timing means, and for further processing of the elapsed times, the method comprising the steps of arranging the entities, each carrying a respective timing means, near said first transmitting means; passing each of said entities within the predetermined transmitting range of said first transmitting means thereby starting operation of said respective timing means in a counting mode; passing each of said entities, at the end of the event, within the predetermined transmitting range of said second transmitting means to thereby stop the counting operation of said respective timing means and causing the count of each timing means to be stored in the respective memory means thereof; individually connecting each of the said timing means to said read-out and processing means and transferring the stored count for each individual entity into the read-out and processing means; converting the transferred counts to an elapsed time value for each timing means; and displaying the elapsed time values for each timing means.

4,571,699

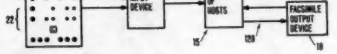
OPTICAL MARK RECOGNITION FOR CONTROLLING INPUT DEVICES, HOSTS, AND OUTPUT DEVICES

Alexander Herzog; Larry L. Honomichl; Jagdish M. Nagda, all of Boulder, and Teddy A. Rehage, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,708

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—900 **5 Claims**



1. The combination comprising:

documents containing information to be communicated over a network means, said network means including

a plurality of station means, each station means including

scanning means for converting the information contained in said documents into electrical signals,

transmission means coupled to said scanning means for transmitting said electrical signals,

receiving means for receiving transmitted electrical signals, and

printing means coupled to said receiving means for converting received electrical signals into documents; and

a plurality of interconnected host means, each coupled to at least one of said station means for selectively routing transmitted electrical signals from the transmission means of a coupled station means to a designated host means, for selectively routing transmitted electrical signals from one host means to another host means, and for selectively routing transmitted electrical signals from a host means to the receiving means of a designated coupled station means;

job control document means for conveying information via said scanning means and transmission means of a station means to control the selective routing of electrical signals by said host means, said job control document means including

means for conveying input control information,

means for conveying output control information, and

means for conveying routing distribution information;

means in each of said plurality of host means for recognizing and interpreting input control information to cause said host means to accumulate electrical signals representative of a number of documents containing information to be

communicated, said number of documents specified by said input control information; and

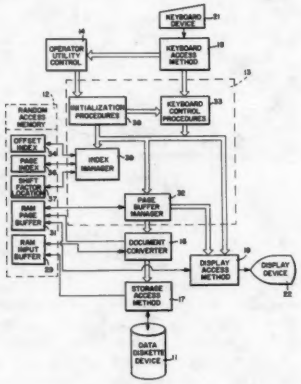
means in each of said plurality of host means for recognizing and interpreting routing distribution information to cause said host means to route said accumulated electrical signals to another host as specified by said routing distribution information including output control information and routing distribution information for intermediate host means in the path to said designated coupled station means.

4,571,700

PAGE INDEXING SYSTEM FOR ACCESSING SEQUENTIALLY STORED DATA REPRESENTING A MULTI-PAGE DOCUMENT

Carl A. Emry, Jr., Round Rock; Grover H. Neuman; Lynda K. Mersiovsky, both of Austin, all of Tex., and Margaret S. Pfeuffer, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1983, Ser. No. 504,825
Int. Cl.⁴ G06F *12/00, 13/00, 15/40*
U.S. Cl. 364—900 **5 Claims**



3. A method for maintaining an index of page entities in a sequential data stream representative of a multipage document including the steps of:

storing said sequential data stream in a first storage;

determining the locations of the page entities within said sequential data stream;

storing the addresses of selected ones of said page entities in a second storage having a fixed number of positions for storage of a page entity in each position;

storing page entity locators of said second storage in a third storage which has a number of locator positions equal to the fixed number of positions for storage of page entities in said second storage;

reorganizing said second and third storage means by erasing selected positions of said page entity locators in said third storage means thereby releasing each page entity position in said second storage relating to said erased page entity locator in said third storage;

entering new storage page entities into released positions in said second storage;

entering new page entity locators into said third storage which are higher numbered than said erased locators;

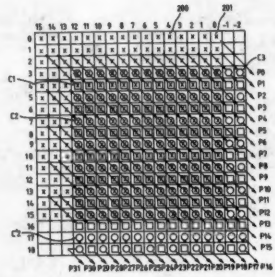
increasing the number of pages spanned by said second storage means by said reorganization.

4,571,701

INTEGRATED CIRCUIT FAST MULTIPLIER STRUCTURE

Claude P. H. Lerouge, Maurefas, France, assignor to International Standard Electric Corp., New York, N.Y.

Filed Mar. 18, 1983, Ser. No. 476,689
Claims priority, application France, Mar. 25, 1982, 82 05083
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—757 **5 Claims**



1. A high-speed multiplier structure of MOS integrated circuit design for the multiplication of two binary words of N bits, the said structure comprising N^2 elementary multipliers arranged in a square matrix, each furnishing the partial product of a bit of the first of the said words, assigned to the corresponding column of the matrix, and a bit of the second word, assigned to the corresponding line of the matrix, and elementary binary adder cells associated with the elementary multipliers to produce the successive sums required to obtain the 2N bits of the final product, these cells also being arranged in an associated matrix in which the sum output of each cell is connected to an input of the adjacent cell in the direction of the matrix diagonal passing through the elementary multipliers furnishing partial products of the same order and in which the carry output of each cell is connected to an input of the adjacent cell in the direction, line or column of the said associated matrix, going toward the output side of the latter matrix furnishing the most significant bits of the final product, the improvement comprising said binary adder cells each including a sum output and being of the high-speed carry propagation type, said cells being arranged to transfer the intermediate results at their sum outputs along said matrix diagonal to the respective cell p lines and p columns distant therefrom, where p is a whole number greater than one, wherein the said associated matrix of binary adder cells does not contain cells associated with the first p lines and columns of said elementary multipliers, and wherein said associated matrix of binary adders include p-1 columns or lines of additional cells on the output side of the matrix arranged to furnish the least significant bits and p lines or columns of additional cells on the output side of the matrix arranged to furnish the most significant bits, the said additional cells serving to gather the intermediate results furnished by the cells p columns and p lines distant therefrom on the input side thereof of the associated matrix in order to produce the bits of the final product.

4,571,702

POWERLESS REMOTE PROGRAM RESERVOIR

James M. DeArras, Richmond, Va., assignor to Hand-Held Products, Inc., Charlotte, N.C.

Filed Aug. 9, 1982, Ser. No. 406,480
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—900 **7 Claims**

1. An apparatus for making available to a calculator remote programs on at least one memory chip and transferring data

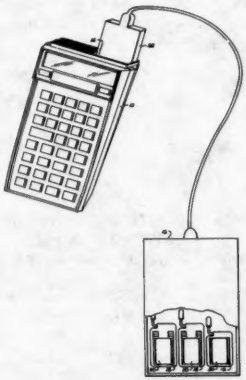
stored in said chip into said calculator using power only from a power supply of said calculator, comprising:

connector means for connecting said calculator with said apparatus, and supplying a chain of clock pulses from said calculator therethrough to said apparatus;

temporary storage means for receiving data from said chip and subsequently outputting the same;

a capacitor connected by said connector means to said power supply for being charged thereby;

means for operating said chip with power generated by discharging said charged capacitor for a predetermined



interval of time between adjacent of said clock pulses to transfer said data stored in said chip to said temporary storage means;

means for transferring said data from said temporary storage means to said calculator at a slower rate than that which said data was transferred into said temporary storage means from said chip; and

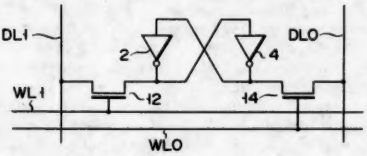
means for cutting off power being generated by the discharging capacitor to said chip immediately after said data is transferred from said chip to said temporary storage means, thereby minimizing the power requirement for transferring data from said chip to said calculator.

4,571,703

STATIC SEMICONDUCTOR MEMORY DEVICE

Makoto Noda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 23, 1983, Ser. No. 497,137
Claims priority, application Japan, May 31, 1982, 57-92928
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—154 **6 Claims**



5. A static memory cell coupled to a pair of digit lines providing data for write-in to said cell and for receiving data for read-out from said cell and also coupled to a pair of word lines to select said cell for both read-out and write-in from said cell, said cell comprising:

a flip-flop circuit having first and second biastable output nodes; and

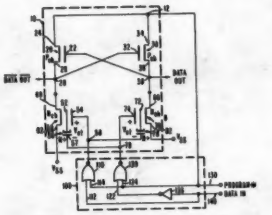
first and second MOS transistors whose current paths are coupled at one end to the first and second bistable output nodes, respectively, and coupled at another end to different ones of said pair of digit lines, providing data for write-in to said cell and receiving data for read-out from said cell, and whose gates are each coupled to a different one of said word lines.

4,571,704

NONVOLATILE LATCH

Frank J. Bohac, Jr., Laguna Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 17, 1984, Ser. No. 581,482
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—156 **11 Claims**



1. A nonvolatile semiconductor memory unit having first and second circuit branches coupled in parallel and comprising:

first and second metal-oxide-semiconductor field effect transistors (MOSFET) devices respectively disposed in said first and second circuit branches, the respective gate of each MOSFET device being cross-coupled to the respective drain of the other of said MOSFET devices;

first and second floating gate MOSFET devices, each having a control gate and an insulated floating gate, respectively disposed in said first and second circuit branches with their source and drain coupled in series with the source and drain of said respective first and second MOSFET devices;

first charging means coupled to the floating gate of said first floating gate MOSFET device and adapted to place either a net positive or a net negative charge on said floating gate so that said first floating gate MOSFET device is selectively operable in the depletion mode or in the enhancement mode;

second charging means coupled to the floating gate of said second floating gate MOSFET device and adapted to place either a net positive or a net negative charge on said floating gate so that said second floating gate MOSFET device is selectively operable in the enhancement mode or in the depletion mode; and

data input means coupled to said first and second charging means and said control gates of said first and second floating gate MOSFET devices.

4,571,705

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH ELECTRICALLY SELECTABLE, ERASABLE AND PROGRAMMABLE FUNCTION

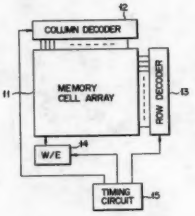
Masashi Wada, Yokohama, Japan, assignor to Toyko Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1983, Ser. No. 527,483
Claims priority, application Japan, Sep. 30, 1982, 57-171381
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—195 **6 Claims**

1. A nonvolatile semiconductor memory device with electrically selectable, erasable and programmable functions comprising:

a plurality of memory cells arranged in a matrix array, each of said memory cells including a source and a drain separately formed in said semiconductor substrate, a floating gate formed on an insulating film formed on a channel region between said source and drain, a program electrode, and wherein said program electrode and said floating gate are stacked with a very thin insulation film interposed therebetween, and first and second control gates formed in a capacitance-coupled manner on an insulation film formed on said floating gate;

said memory cells on each of column of said matrix arrayed memory cells having first control gates connected to one another, while said memory cells on each of row having second control gates connected to one another;



select means for properly selecting predetermined memory cell by setting a potential relation between said first and second control gates; and

timing means for providing a program inhibition period ranging over a period including the time point at which a program potential for programming the contents in the memory cell selected by said select means is supplied to said program electrode, said timing means keeping one of said first and second control gates of all memory cells at high potential during said program inhibition period, while keeping the other of said control gates at low potential.

4,571,706

SEMICONDUCTOR MEMORY DEVICE

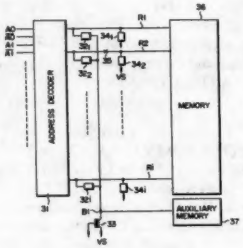
Hiroshi Iwahashi, Yokohama, and Shoji Ariizumi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 23, 1983, Ser. No. 477,882

Claims priority, application Japan, Mar. 25, 1982, 57-47722; Mar. 25, 1982, 57-47724; Apr. 5, 1982, 57-56278

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—200 **21 Claims**



1. A semiconductor memory device comprising:

a main memory;

a decoder for accessing said main memory;

an auxiliary memory;

impedance means provided between said decoder and said auxiliary memory;

means for changing impedance of said impedance means for accessing said auxiliary memory when said main memory contains an error bit cell;

means for preventing said decoder from accessing the error bit cell in said main memory; and

level holding means which is coupled between a junction of said impedance means and said auxiliary memory and a reference potential, and keeps a signal level at said junction at a nonselect level for said auxiliary memory when said main memory is selected, and keeps the signal level at said junction at a select level for said auxiliary memory when said auxiliary memory is selected.

4,571,707

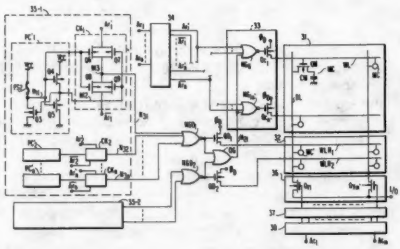
MEMORY CIRCUIT WITH IMPROVED REDUNDANT STRUCTURE

Takayuki Watanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 23, 1984, Ser. No. 582,649

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—200 **9 Claims**



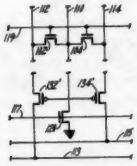
1. In a semiconductor memory of the type having a normal array of memory cells, means for accessing cells in said normal array in response to address information applied to said semiconductor memory, a redundant array of cells for substituting for faulty cells in said normal array, and an address control circuit responsive to said address information for causing said memory to access cells of said redundant array in substitution for cells in said normal array when said address information addresses faulty cells in said normal array, wherein said address control circuit comprises,

a programmable read only memory (PROM) consisting of a plurality of PROM cells, each of said PROM cells having a first series circuit of a fusible link and a first field effect transistor of a first conductivity type for connection between a first voltage terminal and a second voltage terminal, a second series circuit of a second field effect transistor of a second conductivity type and a third field effect transistor of said first conductivity type for connection between said first voltage terminal and said second voltage terminal in series, means for connecting gates of said second and third transistors to an intermediate junction of said first series circuit, and means for connecting a gate of said first transistor to an intermediate junction of said second series circuit, whereby the connection-disconnection condition of said fusible member determines the state of information stored in said cell.

4,571,708
CMOS ROM DATA SELECT CIRCUIT

Harold L. Davis, The Colony, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Dec. 26, 1984, Ser. No. 686,330
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—203 **1 Claim**

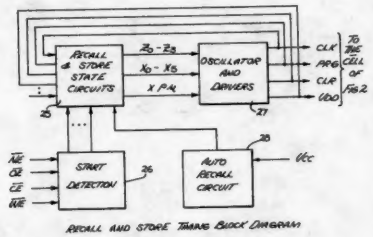


1. A data selection circuit for a CMOS memory integrated circuit having a column line bracketed by first and second bit lines and having at least one pair of data storage transistors connected respectively between said column line and said first bit line and between said column line and said second bit line, each pair of said at least one pair of data storage transistors having a gate connected to a common row line of a set of at least one row line, said column line being connected through an N-channel pull-down transistor to ground and each of said bit lines being connected through a P-channel pass transistor to first and second data lines, respectively, in which said pull-down transistor has a gate electrode connected to a column decode line and each of said pass transistors has a gate connected to said column line, whereby a transition from a positive voltage to ground on said column line in response to a signal on said column decode line turns on said P-channel pass transistors, establishing a current path between each of said bit lines and a corresponding data line.

4,571,709
TIMING APPARATUS FOR NON-VOLATILE MOS RAM

Joseph A. Skupnjak, San Jose; Douglas J. Lee, and Neil J. Becker, both of Santa Clara, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 31, 1983, Ser. No. 462,190
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—233 **13 Claims**



RECALL AND STORE TIMING BLOCK DIAGRAM

1. An integrated circuit, metal-oxide-semiconductor, non-volatile memory comprising:

a plurality of non-volatile memory cells requiring a first predetermined sequence of first signals for non-volatile storage of data and a second predetermined sequence of second signals for recalling of data;

driver circuits for generating said first and second signals, said driver circuits coupled to said cells;

state logic means for initiating the generation of said first and second sequence of said first and second signals, respectively, comprising a plurality of logic circuits each of which has discrete states, output signals from said logic circuits being coupled as inputs to said logic circuits for determining said states and being coupled to said driver circuits, said first and second signals also being coupled to said logic circuits as inputs for said determination of said states;

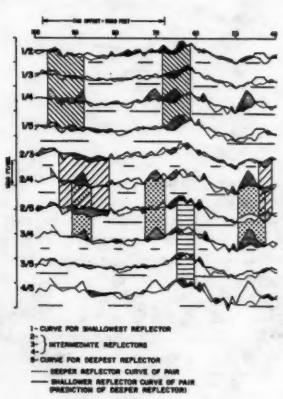
control circuit means for receiving a plurality of externally generated control signals and for generating internal control signals which are coupled as inputs to said logic circuits,

whereby said first and second signals are generated in said first and second predetermined sequences, respectively.

4,571,710
SEISMIC METHOD FOR IDENTIFYING LOW VELOCITY SUBSURFACE ZONES

Norman S. Neidell, 13054 Taylorcrest, Houston, Tex. 77079, and Ernest E. Cook, 11711 Memorial Dr. #153, Houston, Tex. 77024

Filed Aug. 31, 1982, Ser. No. 413,428
Int. Cl.[4] G01V *1/30*
U.S. Cl. 367—38 **14 Claims**


1- CURVE FOR SHALLOWEST REFLECTOR
2-
3- INTERMEDIATE REFLECTORS
4-
5- CURVE FOR DEEPEST REFLECTOR
DEEPER REFLECTOR CURVE OF PAIR
SHALLOWER REFLECTOR CURVE OF PAIR (PREDICTION OF DEEPER REFLECTOR)

9. A seismic method for identifying low velocity subsurface zones which may be of reservoir quality, comprising;

(a) marking reflections of interest on a stacked seismic profile;

(b) timing the reflections of interest by common depth point basis and listing them;

(c) plotting the times listed on the velocity analyses;

(d) selecting stacking velocities that correspond to selected reflections, said stacking velocities being along the plotted times on the stacking velocity analyses;

(e) obtaining stacking velocities on a shot point by shot point basis;

(f) tracking seismic reflections of interest according to stacking velocity on an analysis-by-analysis basis using the times from said reflections from said seismic profile;

(g) plotting selected velocity curves for each selected reflection;

(h) overlaying in best fit manner each of the selected velocity curves with each of the other velocity curves taken in turn for each selected reflection;

(i) conducting a semi-empirical alignment to compensate for possible development of discordance dip between the particular reflector pairs;

(j) arranging overlain pairs of velocity curves in order of depth, the overlain pairs of velocity curves defining low velocity disparity zones;

(k) preparing an aperture equation giving an aperture length for each reflector pair;

(l) plotting the resulting aperture on the display of overlain

pairs for reference in confirming the reality of possible low velocity zones,

(m) coloring low velocity disparity zones to enhance the visual identity thereof; and

(n) placing vertical lines on said display to bracket zones of consistent low velocity disparity.

4,571,711

SONAR APPARATUS

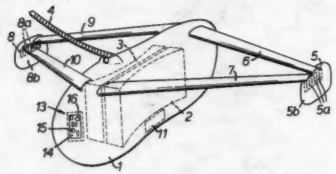
Victor J. Chadwick, Dorset, England, assignor to Plessey Overseas Limited, Ilford, England

Continuation-in-part of Ser. No. 237,659, Feb. 24, 1981, abandoned. This application Jan. 11, 1983, Ser. No. 457,264

Claims priority, application United Kingdom, Feb. 26, 1980, 8006416

Int. Cl.⁴ G01S *7/52*

U.S. Cl. 367—88 **17 Claims**



1. A sonar survey apparatus comprising a submersible vessel having a structure adapted to receive a towing cable, a sonar signal transmitter transducer means mounted on the structure, at least one acoustic reflector mounted on the structure and shaped to produce, in a focussing plane, line foci of acoustic echo signals received from remote positions, a line array of receiver transducer elements mounted on the structure in the focussing plane and extending in line substantially at right angles to the line foci, each receiver transducer element having an output for providing a signal representative of a focussed echo signal, selector means coupled with the output of each of the receiver transducer elements, the selector means having a control input and an output and being operable in response to a control signal to select the output of a receiver transducer element, relating to a predetermined direction, for display and sensing means mounted on the body for detecting movement of the vessel relative to a predetermined orientation and for providing a control signal for the selector means whereby selection of a different receiver transducer element is effected so that the selector means continues to provide an output relating to said predetermined direction.

4,571,712

BEAM ALIGNMENT SIGNAL PROCESSING

Paul M. Romano; James W. Baer, and James W. Hargarten, all of Boulder County, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,682

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **15 Claims**

1. A method for generating a position control signal for use in a beam alignment system, said beam alignment system being adapted to maintain a prescribed alignment between first and second beams that travel along an optical path, said beam alignment system having a detector included therein that generates a position signal representative of the position at which a beam of radiation, or at which the centroid associated with a plurality of beams of radiation, falls upon a surface of said detector, said method comprising the steps of:

(a) splitting a portion of said first and second beams away from said optical path such that the alignment between said split beam portions represents the alignment of said first and second beams;

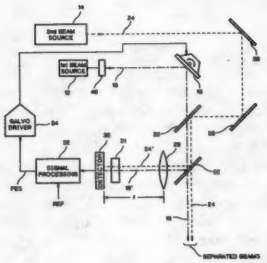
(b) focusing said first and second split beam portions onto the surface of said detector;

(c) turning off said second beam, thereby leaving only the split beam portion from said first beam as the beam falling upon the surface of the detector;

(d) storing the detected position signal of the beam falling upon the detector in step (c);

(e) turning on said second beam, thereby having the split beam portions from said first and second beams as the beams falling upon the surface of the detector;

(f) storing the detected position signal of the centroid associated with the beams falling upon the detector in step (e);



(g) determining the offset associated with the detector when no beams are falling upon the surface thereof;

(h) correcting the position signal stored in step (d) to remove the offset therefrom determined in step (g);

(i) generating a corrected position signal representative of the position at which the second beam portion is falling upon the surface of the detector based upon the signals stored in steps (d), (f), and (g), said corrected position signal having the effects of the offset measured in step (g) removed therefrom;

(j) finding the difference between the position signal stored in step (d) and the position signal generated in step (g); and

(k) deriving the desired position control signal from the difference found in step (j).

4,571,713

DIGITAL DATA RECORD

Richard Ackerman; Donovan H. Hurlbut, and Alan A. Jewer, all of Whitewater, Wis., assignors to News Log International, Inc., Janesville, Wis.

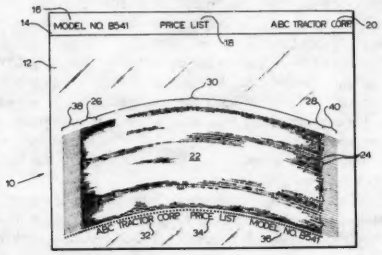
Continuation of Ser. No. 290,475, Aug. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 181,172, Aug. 25, 1980, abandoned. This application Jun. 28, 1984, Ser. No. 625,573

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—44 **15 Claims**

1. An information record comprising: a generally flat body;

and digital information carried on said body in arcuate rows, said rows of digital information having the same radius and



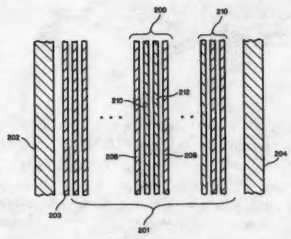
being disposed in a spaced-apart nested arrangement along a common center line extending transversely of said rows.

4,571,714

READ BEAM POSITION CALIBRATION

Harlan P. Mathews; Paul Romano, and Alexander M. Muckle, all of Boulder County, Colo., assignors to Storage Technology Partners II, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,685
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **17 Claims**



5. A data read beam calibration system for use in an optical storage system to insure that radiation beams directed to a surface of a recording medium used with said storage system are properly aligned with data tracks written on said recording medium, said storage system including means for following a previously written track with a first radiatiion beam, and means for positioning a data read radiation beam a desired distance from said first radiation beam in response to an offset signal, said data read beam calibration system comprising:

a plurality of calibration tracks written on the record carrier having a desired track pitch or distance therebetween;

means for optically measuring the data read beam location with respect to a calibration track and for generating an offset signal in response to the measurement; and

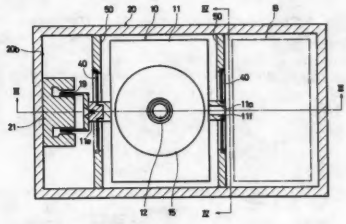
means for positioning the data read beam in subsequent read operations, said means being responsive to the offset signal.

4,571,715

OPTICAL HEAD MOVABLE IN A TRACKING DIRECTION

Kikuji Kato, Tokorozawashi; Akinori Watabe, Yokohamashi; Hiroo Ukita, Kodairashi, and Susumu Yonezawa, Yokosukashi, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,680
Claims priority, application Japan, Feb. 22, 1982, 57-26156; Apr. 5, 1982, 57-56192
Int. Cl.[4] G11B *7/08*
U.S. Cl. 369—45 **7 Claims**



1. An optical head arrangement for use with an optical disk, comprising

an optical head unit including a lens system for focusing a light beam received from a given direction onto a recording surface of said optical disk, a focus control mechanism for focal adjustment of said lens system in said given direction relative to said unit and optical path conversion means fixed to said unit in the optical path of said light beam for changing the optical path to said given direction from a direction substantially parallel to said disk surface,

a housing containing said unit and having unit supporting means for mounting said unit movably in said parallel direction only,

said supporting means including at least two supporting diaphragms disposed in said given direction on opposite sides of said unit, each diaphgram having an outer portion and a center portion with one of said portions being connected to said housing and the other to said unit, each diaphgram further having in its plane between said portions a plurality of interconnected planar spring elements with slots inbetween, and

control means for controlling the positions of said unit relative to said housing in said parallel direction for track control as to said disk and without causing, due to the presence of said diaphragm, any significant displacement of said unit in said given direction,

wherein said supporting means includes at least two spaced supporting diaphragms on at least one of said sides.

4,571,716

METHOD AND APPARATUS FOR SCANNING A RECORDING MEDIUM FOR DEFECTS

Stanley R. Szerlip, Panorama City, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 230,920, Feb. 2, 1981. This application Jun. 29, 1984, Ser. No. 626,343
Int. Cl.[4] G11B *7/007, 7/09, 7/135*
U.S. Cl. 369—54 **2 Claims**

1. Apparatus for recording a data signal on a light-reflective disc, comprising:

means for producing a write beam of light;

means for modulating the intensity of said write beam of light, in accordance with the data signal;

optical means including a source of light for producing a pre-write beam of light, and means for directing at the disc both said pre-write beam of light and the intensity-modulated write beam of light, said write beam having a

peak intensity sufficiently high to modify the reflectivity of the disc at its point of impingement thereon, said pre-write beam having an intensity sufficiently low that it is reflected by the disc in accordance with the reflectivity of the disc at its point of impingement thereon, the reflectivity of the disc not being affected thereby;

means for rotating the disc relative to the pre-write and write beams, whereby the rotating disc is impinged simultaneously by both beams and the data signal is recorded on the disc by said write beam thereby forming a recording track therein;

said optical means including means for positioning the pre-write beam and the write beam relative to each other such that the pre-write beam leads the write beam by a prescribed amount and falls on a non-recorded region of the disc ahead of said write beam;

means operable to produce and direct at the disc a second pre-write beam of light, having an intensity sufficiently low that the reflectivity of the disc is not affected thereby, wherein said second pre-write beam is positioned to scan the disc in advance of the write beam, and wherein said second pre-write beam is reflected by the disc in accordance with the reflectivity of the disc at its point of impingement thereon; and

defect detection means for monitoring the intensities of the reflected first and second pre-write beams, and for producing a defect detect signal whenever the intensity of the reflected second pre-write beam differs from that of the reflected first pre-write beam by more than a prescribed amount; and

control means, responsive to the defect detect signal, for uncoupling the data signal from said modulating means, whereby the recording of the data signal on the disc is interrupted each time a defect is encountered and in advance of the defect reaching the point of impingement of the write beam.

4,571,717

ADAPTER FOR A PLUG-IN CARTRIDGE

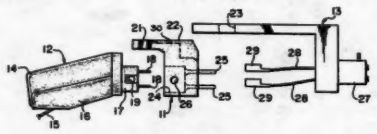
Kenneth Reichel, Hudson; Frederick W. Nichols, III, Akron, and Norm Levenstein, Munroe Falls, all of Ohio, assignors to Kabushiki Kaisha Audio-Technica, Tokyo, Japan

Continuation-in-part of Ser. No. 561,676, Dec. 15, 1983, abandoned. This application Mar. 7, 1985, Ser. No. 708,975

Claims priority, application Japan, Dec. 16, 1982, 57-190223

Int. Cl.[4] G11B *3/04, 21/16*

U.S. Cl. 369—256 **2 Claims**



1. An adapter assembly for a phonographic tone arm to permit the mounting of a plug-in P-mount cartridge in a head shell of a tone arm having mounting holes spaced approximately one-half inch apart, said P-mount cartridge having a plurality of axially extending contact pins and a rectangular mount portion, said adapter assembly comprising:

an adapter housing having a recessed opening on a front side for engaging and making a substantially tight fitting contact with said rectangular mount portion to thereby securely hold said P-mount cartridge;

a plurality of hollow terminal pins axially extending from a rear side opposite said front side, each of said hollow terminal pins accepting a corresponding one of said cartridge contact pins when said cartridge is engaged in said recessed opening; and

fastening means for securing said adapter housing to said head shell and,

a plurality of parallel grooves in said adapter housing for attenuating unwanted acoustic vibrations in said tone arm

whereby said adapter assembly, in combination with said P-mount cartridge, has a mass and center of gravity which permits the facile maintenance of the tone arm balance.

4,571,718

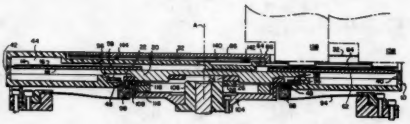
OPTICAL DISK CARTRIDGE AND COOPERATING APPARATUS

Steven P. Cahill, Newton, Mass., and Roger G. Covington, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1984, Ser. No. 629,875

Int. Cl.[4] G11B *7/00;* **G65D** *85/30*

U.S. Cl. 369—291 **16 Claims**



1. An optical disk cartridge adapted for use in cooperating write/read apparatus having a rotatable drive spindle and a movable optical head, said cartridge containing a rigid optical disk including a flat information-storage medium and a magnetically attractable hub with a compliant annular seal thereon projecting from said medium, said cartridge comprising:

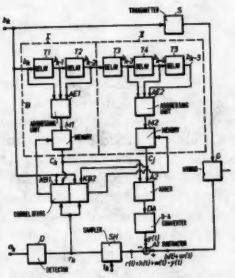
first and second substantially rigid opposed walls fixedly spaced from and substantially coextensive and parallel with each other, said disk being disposed between and substantially parallel with said walls, said first wall having a round opening therein concentric with said hub to provide access thereto by the drive spindle of the cooperating apparatus, said opening being bounded by a circular rim aligned with said annular hub seal, said first wall bearing magnetic means near said rim for attracting said hub and thereby drawing said hub seal into sealing contact with said rim, to retain said disk in stationary, sealed relationship with said first wall when said cartridge is not operatively positioned in the cooperating apparatus, said hub being engageable and axially movable by the apparatus drive spindle away from said first wall, in opposition to said magnetic means, to urge said disk out of said stationary, sealed relationship and thereby render said disk free to rotate when said cartridge is operatively positioned in the cooperating apparatus.

4,571,719

FIR-TYPE BALANCE FILTER INCORPORATED IN THE TRANSMITTER-RECEIVER UNIT IN A TELECOMMUNICATION SYSTEM

Bengt R. Carlqvist, Bromma, and Lars T. E. Svensson, Skärholmen, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00362, § 371 Date Jun. 16, 1983, § 102(e) Date Jun. 16, 1983, PCT Pub. No. WO83/01715, PCT Pub. Date May 11, 1983
PCT Filed Nov. 2, 1982, Ser. No. 514,824
Claims priority, application Sweden, Nov. 2, 1981, 8106445
Int. Cl.[4] H04J 15/00; H04L 5/14
U.S. Cl. 370—32 11 Claims



1. In a transmit-receiver of a digital transmission system which includes a transmission means to a remote transmit-receiver

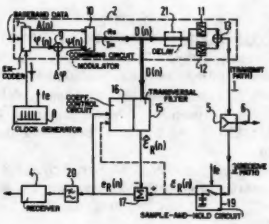
and including a source of digital data signals, a transmitter means for transmitting a representation of the digital data signals, a hybrid junction means for connecting said transmitter means to said transmission means, an analog signal subtracting means having a minuend input connected to said hybrid junction means, a subtrahend input and a remainder output for generating a remainder signal, sampling means for periodically sampling said remainder signal and detector means for binary digitizing the sampled remainder signal, an FIR type balance filter comprising a first set of serially connected delay means each having an input and an output, the input of the first delay means of said first set being adapted to receive the digital data signals, a second set of serially connected delay means each having an input and an output, the input of the first delay means of said second set being connected to the output of the last delay means of said first set, first means responsive to the sampled remainder signal and to the combination of data signals at the outputs of the delay means of said first set for generating a first partial correction value, second means responsive to the sampled remainder signal, a combination of data signals at the outputs of the delay means of said second set for generating a second correction value, and third means having an output connected to said subtrahend input for combining said first and second correction values to form said correction signal.

4,571,720

METHOD AND APPARATUS FOR REDUCING THE CONVERGENCE TIME OF AN ECHO CANCELLER

Jean-Philippe J. Chevreau, Paris, and Loic B. Y. Guidoux, Garancieres, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Feb. 23, 1984, Ser. No. 583,067
Claims priority, application France, Feb. 25, 1983, 83 03113
Int. Cl.[4] H04B 3/20
U.S. Cl. 370—32 6 Claims



1. A method for reducing the convergence time of an echo canceller connected in a transceiver arrangement between one-way transmit and receive paths coupled to a two-way transmission path and used to cancel an echo signal occurring in the receive path in response to a signal supplied to the transmit path, said echo canceller comprising a transversal filter having N adjustable complex coefficients for processing a complex signal derived from the signal supplied to the transmit path and arranged to supply a real signal component, said echo canceller also comprising a difference circuit for producing a difference signal between the signal in the receive path and the output signal of the transversal filter, this method comprising the steps of:

transmitting in the transmit path a complex periodic training signal constituted by data d(n) occuring at instants nT, where T is the data interval and n is an integer, the data being in sequences having a period LT, where L is the number of data in each sequence and LT is at least equal to NT, and having the property:

$$\frac{1}{\sigma^2}\sum_{n=0}^{L-1} d(n)\cdot d^*[(n-i)\text{modulo } L] = -1$$

for every integer i such that $1 \leqq i \leqq N-1$, $d^*(n)$ being the complex conjugate value of d(n) and σ^2 being a constant term representative of the power of each of the transmitted data;

said transmitted training signal further having the property:

$$\frac{1}{\sigma^2}\sum_{n=0}^{L-1} d^*(n)\cdot d^*[(n-i)\text{modulo } L] = -1$$

for every integer i such that $0 \leqq i \leqq N-1$;

and after the transmission of a sequence of at least N data of the training signal, calculating the coefficients of the transversal filter for echo signal cancellation from the sequence of coefficients formed by transmission of the next sequence of L data, in accordance with the expression:

$$C = C_o + \frac{2}{(L+1)^2}\sum_{n=0}^{L-1} e_R(n)\cdot D^*(n)$$

where C is the vector of the N coefficients obtained at the end of the calculation,

C_o is the vector of the N initial coefficients,

$e_R(n)$ is said difference signal,

$D^x(n)$ is the vector of the complex conjugate of values of the last N data entering the transversal filter, and

σ^2 is a constant term representative of the power of each of the transmitted data.

4,571,721

COMPOSITE CONCENTRATION SYSTEM

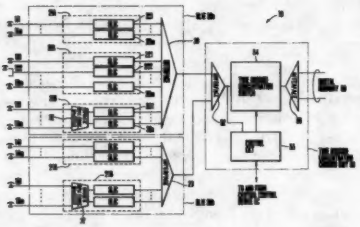
Tadahiko Yasui, Tokyo; Shizuo Ito; Akira Horiki, both of Kanagawa; Hajime Yamada, and Takashi Usami, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation; Nippon Electronic Co., Ltd.; Hitachi, Ltd.; Oki Electric Industry, Ltd. and Fujitsu Limited, all of, Japan

Filed Sep. 16, 1982, Ser. No. 418,898

Claims priority, application Japan, Sep. 18, 1981, 56-147573

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—56 **6 Claims**



1. A composite concentration system comprising:

a time division concentration switch for collecting and distributing digitized data;

first subscriber line interface means having a first plurality of subscriber line input terminals and a plurality of subscriber line interface circuits equal in number to said first plurality of subscriber line input terminals, each of said subscriber line interface circuits connected to one of said subscriber line input terminals and each subscriber line interface circuit having means for converting analog voice signals received at said subscriber line input terminals into digitized data and for converting digitized data received from said time division concentration switch to analog voice signals;

second subscriber line interface means having a second plurality of subscriber line input terminals equal in number to said first plurality of subscriber line input terminals, a space division concentration switch and a third plurality of subscriber line interface circuits, functionally identical to the subscriber line interface circuits of said first subscriber line interface means, said second subscriber line interface means having said second plurality of subscriber line input terminals connected to said space division concentration switch and said space division concentration switch connected to said third plurality of subscriber line interface circuits; and

switch interface means having a plurality of channels connected to said time division concentration switch, said switch interface means assigning the digitized data from each of said subscriber line interface circuits of said first and second subscriber line interface means to one of said channels and for assigning the digitized data from said time division concentration switch to one of said subscriber line interface circuits.

4,571,722

INTEGRATED SERVICE MULTIPLEX EQUIPMENT

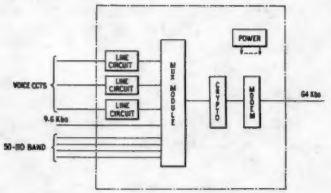
John Bingham, Dunmow, and Allen W. Oliver, Bishops Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,356

Claims priority, application United Kingdom, Jul. 13, 1983, 8318898

Int. Cl.[4] H04J *3/06*

U.S. Cl. 370—106 **4 Claims**



1. A method of establishing synchronisation in a time division multiplex system, which comprises:

applying a locally-generated synchronisation pattern to an input of a multiplex module of said system so that a unique byte pattern, including a framing pattern and a channel number with a status indicator, occurs in each of a plurality of the multiplex channels of said module,

detecting at the receiving side of said module the content of the nth channel as received by said module,

responding to said framing pattern in said received byte stream to establish alignment between said nth channel at said module and said received byte stream without taking account of the unique pattern at which said alignment has been achieved,

recording from said unique pattern the identity of the channel of the received stream at which alignment has been achieved,

determining from said identity recording an offset which defines the difference between said nth channel and said channel at which said byte alignment has been achieved,

applying said channel offset to said multiplex module's demultiplexing logic to control said logic so that the channel number received in said nth channel is correct,

setting said status indicator of each of said channel numbers, in response to establishment of said byte alignment, to a condition indicating that frame alignment has been achieved, and

assuming that synchronisation has been achieved when a correct channel number byte has been received with its said status indicator set.

4,571,723

PULSE CODE MODULATED DIGITAL TELEPHONY TONE GENERATOR

Bruce B. Lusignan, Palo Alto; James Sytwu, Sunnyvale, and Amr Badawi, Stanford, all of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 24, 1983, Ser. No. 545,078

Int. Cl.[4] H04J *3/12*; H04M *1/00*

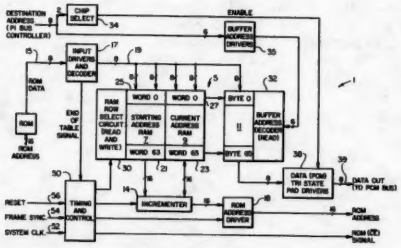
U.S. Cl. 370—110.2 **11 Claims**

1. A system for generating and transmitting readily accessible tone signals comprising:

(a) a read only memory for storing a plurality of digitally encoded tone signals, each signal comprising a finite series of digital signals each representing a sample of the waveform to be transmitted; and

(b) a controller for retrieving the set of digital samples representing the plurality of said tone signals and transmitting said digital signals on a pulse code modulated time divi-

sion multiplex data bus to a plurality of defined destinations in response to receipt of origination addresses, said controller further comprising buffer means for storing a



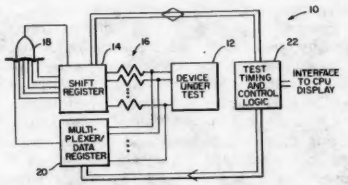
sample of each tone signal stored in said ROM and means for responding to origination addresses for substantially simultaneously transmitting any of said tone signals to a plurality of destination addresses.

4,571,724

SYSTEM FOR TESTING DIGITAL LOGIC DEVICES

Victor E. Belmondo, King County, Wash.; Russell M. dePina, Santa Clara County, Calif.; George W. James, King County, Wash.; Robert G. Martin, Snohomish County, Wash., and John M. Reece, King County, Wash., assignors to Data I/O Corporation, Redmond, Wash.

Filed Mar. 23, 1983, Ser. No. 478,412
Int. Cl.[4] G01R *31/28*; G06F *11/00*
U.S. Cl. 371—25 **15 Claims**



1. A system for testing a logic device having a plurality of electrical contacts which serve as either inputs to or outputs from said logic device, said system comprising:

a first shift register having a plurality of stages each receiving a respective input and generating a respective output, all such stages except a first stage receiving an input from a previous stage and each of said stages except a last stage applying its output to a subsequent stage;

an isolation element connecting each of a plurality of electrical contacts of said logic device to the output of a corresponding stage of said shift register so that the logic level on each electrical contact serving as an input is controlled by the output of a corresponding shift register stage and the logic level on each electrical contact serving as an output is controlled by the output of said logic device, whereby said shift register applies a test vector to said logic device without the need to determine whether each electrical contact is serving as an input or an output;

an exclusive OR gate having an output applied to the input of the first stage of said shift register and a plurality of inputs receiving the outputs of a plurality of stages of said shift register and the signals on a plurality of the electrical contacts of said logic device;

timing and control circuit means connected to said shift register for controlling the operation of said shift register and allowing said logic device to respond to a plurality of said test vectors; and

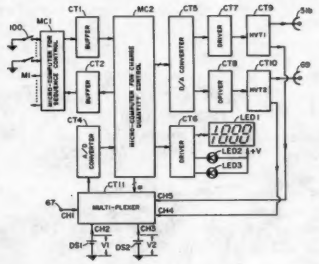
data output means providing an indication of the response of said logic device to a plurality of said test vectors.

4,571,725

IMAGE FORMATION APPARATUS HAVING A DIAGNOSING FUNCTION

Nao Nagashima, Tokyo; Kouki Kuroda, Yokohama; Jyoji Nagahira, Tokyo; Yoshiaki Takayanagi, Kawasaki, and Koji Suzuki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 257,358, Apr. 24, 1981, abandoned.
This application Oct. 7, 1983, Ser. No. 539,963
Claims priority, application Japan, Apr. 26, 1980, 55-56078
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—25 **45 Claims**



1. A self-diagnostic apparatus comprising:

a digital computer;

analog-to-digital converting means for converting an analog signal to a digital signal and for supplying the digital signal to said digital computer; and

input means generating a plurality of reference signals which have different levels, and for supplying said reference signals to said analog-to-digital converting means;

wherein said digital computer is operable to process the digital signal from said analog-to-digital converting means, and is also operable to detect an abnormality in the analog-to-digital converting means by sensing reference digital signals produced by the analog-to-digital converting means from the reference signals, and determining if a signal level of said reference digital signals falls outside a predetermined error range.

4,571,726

HIGH PERFORMANCE OROTRON UTILIZING A DENSE ELECTRON BEAM

Donald E. Wortman, Rockville, and Richard P. Leavitt, Berwyn Heights, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

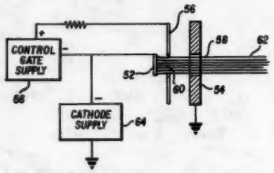
Filed Mar. 30, 1984, Ser. No. 595,210
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—2 **12 Claims**

1. An orotron for generating coherent near millimeter wavelength radiation, which comprises:

an open resonator formed by a first mirror and a second mirror which is spaced from the first mirror, the first mirror including a reflecting diffraction grating facing the second mirror;

beam forming means for generating a high density, ribbon-

like electron beam having an average current density of at least 60 amperes per square centimeter; and



beam directing means for directing the electron beam across the diffraction grating at a velocity selected to generate coherent radiation within the open resonator.

4,571,727

FAR-INFRARED ELECTROMAGNETIC WAVE GENERATOR

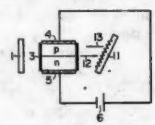
Jun-ichi Nishizawa, and Ken Suto, both of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 229,853, Jan. 30, 1981. This application Aug. 9, 1983, Ser. No. 521,226

Claims priority, application Japan, Mar. 27, 1980, 55-39715; Mar. 27, 1980, 55-39716; Mar. 27, 1980, 55-39717

Int. Cl.[4] H01S *3/30*

U.S. Cl. 372—4 **14 Claims**



1. A far-infrared electromagnetic wave generator comprising:

a polar semiconductor producing a Polariton mode which forms a coupled mode having far-infrared radiation and an optical phonon when the relative vibration of positive and negative ions generates a transverse wave having a coherent lattice vibration frequency w_r and a wave number k, said polar semiconductor containing at least one impurity, said impurity having an excited electron state and a lower electron state, the difference is quantum energy between the excited state and the lower state of said impurity substantially corresponding to a value on a dispersion curve of optical phonons in said semiconductor;

a resonator for effecting positive feedback of an electromagnetic wave corresponding to said difference in quantum energy; and

means for applying an electric current across said semiconductor for accelerating carriers or injecting carriers to excite electrons of said impurity into said excited state, thereby inducing phonon emission transitions toward said lower electron state under a population inversion condition of said impurity, said transition amplifying said Polariton mode wave.

4,571,728

TEMPERATURE CONTROL DEVICE FOR A SEMICONDUCTOR LASER

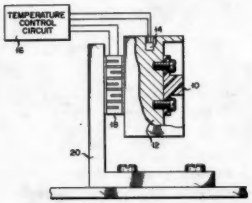
Shoji Yoshikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 481,860, Apr. 4, 1983. This application Jul. 8, 1985, Ser. No. 753,364

Claims priority, application Japan, Apr. 9, 1982, 57-59019

Int. Cl.[4] H01S *3/04, 3/045*

U.S. Cl. 372—36 **19 Claims**



1. A temperature control device for a semiconductor laser comprising:

a Peltier element connected to a semiconductor laser for selectively heating or cooling the semiconductor laser during operation of said semiconductor laser dependng upon the polarity of a current supplied to said Peltier element;

temperature detection means for detecting the temperature of the semiconductor laser during operation thereof;

a single power source of a single given polarity for supplying a current for said Peltier element; and

polarity control means connected between said single polarity power source and said Peltier element for controlling the polarity, from positive to negative and vice versa, of the current supplied to the Peltier element from said single polarity power source during operation of said semiconductor in accordance with the output of said detection means to thereby selectively heat and cool said semiconductor laser during operation thereof to maintain the temperature and output thereof substantially constant during operation thereof; said polarity control means comprising a bridge amplifier including a first inverter supplied with the output of said detection means and the current from said single polarity power source, a first buffer and a second inverter both supplied with the output of said first inverter, and a second buffer supplied with the output of said second inverter, said first and second buffers having respective outputs connected to said Peltier element.

4,571,729

SEMICONDUCTOR LASER HAVING AN INVERTED LAYER IN A PLURALITY OF STEPPED OFFSET PORTIONS

Akira Fujimoto, Hirakata, Japan, assignor to Omron Tateisi Electronics, Co., Kyoto, Japan

Continuation-in-part of Ser. No. 505,481, Jun. 17, 1983. This application Aug. 16, 1983, Ser. No. 523,673

Claims priority, application Japan, Jun. 18, 1982, 57-104774; Jul. 14, 1982, 57-122774; Jul. 14, 1982, 57-122775; Jul. 16, 1982, 57-124253; Aug. 16, 1982, 57-141807

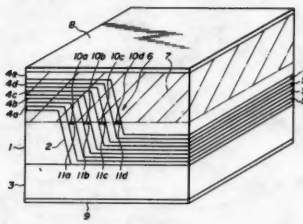
Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—46 **5 Claims**

1. A semiconductor laser, comprising

a semiconductor crystal having a plurality of double heterojunctions formed by the lamination of active layers between first and second clad layers of a semiconductor of a first conductivity type and comprising step portions having step differential portions formed therebetween,

wherein said step differential portions contain active regions formed by PN junctions which provide laser oscillation,



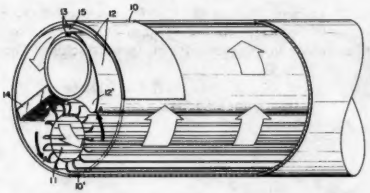
said PN junctions being formed by an inverted layer made by diffusing a conductor of a second conductivity type over an area of the surface of the semiconductor crystal to said step differential portions.

4,571,730

CROSS FLOW TYPE LASER DEVICES

Hakaru Mizoguchi; Akira Egawa, both of Hiratsuka, and Akira Okamoto, Hadano, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed Feb. 16, 1984, Ser. No. 580,801
Claims priority, application Japan, Feb. 21, 1983, 58-27418
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—58 **6 Claims**



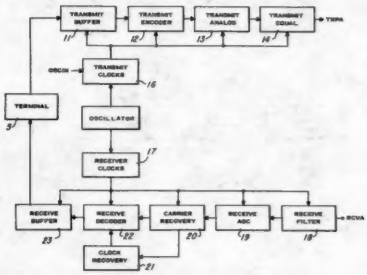
1. A cross flow type laser device comprising a generally cylindrical vacuum vessel defined by a generally cylindrical wall, an impeller in said vacuum vessel, said cylindrical wall and impeller having generally parallel axes, said impeller including a peripheral edge disposed adjacent an inner wall portion of said cylindrical wall and defining therewith a gas laser medium inlet to and a gas laser medium outlet from said impeller, said impeller and vacuum vessel having substantially coextensive axial lengths, means for rotating said impeller to establish a generally closed circumferential flow path for the gas laser medium within said vacuum vessel along said cylindrical wall in a direction from said gas laser medium inlet to said gas medium outlet, axially disposed discharge electrodes withn said vessel spaced downstream of said gas laser medium outlet for exciting the gas laser medium, optical resonator means at axially opposite ends of said vessel for generating a laser light beam from the excited gas laser medium, means for cooling the gas laser medium and an axially extending guide duct means having a front portion disposed adjacent said gas laser medium outlet, said front portion of said guide duct means and said impeller constitute a cross flow impeller, after passing through a diffuser formed by said guide duct means said laser medium discharged by said cross flow impeller reaches a discharge portion and is excited distribution region where energy stored in said region is diverted out as an output beam by a photoresonator.

4,571,731

PSK MODEM FILTER SWITCH

Edward R. Klinkovsky, Brenham, and William A. Severin, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,578
Int. Cl.[4] H04B *1/38*
U.S. Cl. 375—9 **9 Claims**



1. An integrated circuit PSK modem for transmitting and receiving PSK signals derived from digital signals over a first and second carrier frequency respectively, comprising:

(a) transmit encoding means for encoding digital data into a first format for conversion to corresponding PSK signals;

(b) transmit modulating means implemented in switched capacitor circuits and connected to receive the first format, having at least one filter with a plurality of selectable capacitors connected in parallel, for phase modulating the first carrier frequency according to the first format to provide corresponding PSK signals;

(c) receive demodulating means, implemented in switched capacitor circuitry, having at least one filter with a plurality of selectable capacitors connected in parallel, for demodulating the PSK signals on the second carrier frequency to provide PSK signals in a second format for conversion to corresponding digital signals;

(d) receive encoding means connected to receive the second format for encoding the second format into corresponding digital signals; and

(e) switch means, connected to the filter in each of the modulating and demodulating means, each switch means comprising means for selecting at least one capacitor for connection to the filter and means for nullifying the stray capacitance of any unselected capacitor.

4,571,732

ADAPTIVE EQUALIZER FOR BINARY SIGNALS AND METHOD OF OPERATING SAME

Giancarlo Pirani, and Valerio Zingarelli, both of Turin, Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 19, 1984, Ser. No. 601,983
Claims priority, application Italy, Apr. 19, 1983, 67424 A/83
Int. Cl.[4] H04B *3/06*; G06F *15/31*
U.S. Cl. 375—12 **4 Claims**

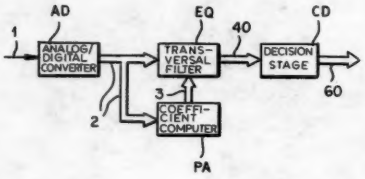
3. In a receiver for binary signals transmitted at high rate over a radio link, including an analog/digital converter for extracting digitized samples from respective symbols contained in the incoming data flow, a decision stage downstream of said converter, and an equalizer comprising a transversal filter inserted between said converter and said decision stage, the improvement wherein said equalizer further comprises a coefficient computer connected to said converter in parallel with said transversal filter, said computer including:

a filter simulator provided with first register means for accumulating a predetermined multiplicity of consecutive

samples from said converter, second register means for storing a set of corrective coefficients usable in said transversal filter, and convoluting means for multiplying the stored coefficients with the accumulated samples;

an error calculator connected to said filter simulator for receiving the products of multiplication emitted by said convoluting means and determining therefrom a mean square error; and

processing means connected to said filter simulator and to said error calculator for obtaining mean square errors



determined by the latter, subtracting and adding predetermined magnitudes from and to a given coefficient c_i stored in said second register means for establishing two collateral values c_i', c_i'' sequentially substituted for said given coefficient in said second register means preparatorily to generation of other mean square errors ϵ_i', ϵ_i'' respectively correlated with said collateral values, said processing means being further adapted to derive from a mean square error ϵ_i pertaining to said given coefficient c_i and from said correlated errors ϵ_i', ϵ_i'' an optimized coefficient c_i in accordance with the following formula:

$$\overline{c_i} = \tfrac{1}{2} \cdot \frac{c_i'^2(\epsilon_i'' - \epsilon_i) - c_i''^2(\epsilon_i' - \epsilon_i)}{c_i'(\epsilon_i'' - \epsilon_i) + c_i''(\epsilon_i' - \epsilon_i)}$$

and to round said optimized coefficient to the nearest power of 2 constituting a new coefficient to be substituted for said given coefficient c_i in said second register means whereby, upon repetition of the same procedure with all coefficients of an initial set stored in said second register means, said initial set is replaced by an updated set giving rise to a new mean square error compared by said processing means with an original mean square error obtained from said initial set by said error calculator, said processing means having an output connection extending to said transversal filter for loading same with said updated set of coefficients upon finding said new mean square error to be less than said original mean square error.

4,571,733

AUTOMATIC EQUALIZATION DEVICE AND METHOD OF STARTING-UP THE SAME

Takashi Kaku, Tama; Shigeyuki Unagami, Zama, and Masayoshi Inoue, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP82/00479, § 371 Date Aug. 17, 1983, § 102(e) Date Aug. 17, 1983, PCT Pub. No. WO83/02373, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 28, 1982, Ser. No. 527,573

Claims priority, application Japan, Dec. 28, 1981, 56-214604

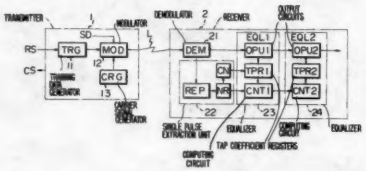
Int. Cl.[4] H04B *3/06, 3/10*

U.S. Cl. 375—13 **8 Claims**

8. A method for initially setting a coefficient of an automatic equalization device in a data communication system, in which a training signal including components of a single pulse signal is transmitted by a transmitter and a single pusle signal is extracted from said training signal by a receiver, and setting an initial coefficient of said automatic equalization device using said extracted single pulse signal, said method comprising the steps of:

(a) receiving said training signal;

(b) generating a delayed training signal;



(c) adding the received training signal and the delayed training signal to produce an extracted single pulse signal; and

(d) initially setting a coefficient of said automatic equalization device in the receiver using said extracted single pulse signal.

4,571,734

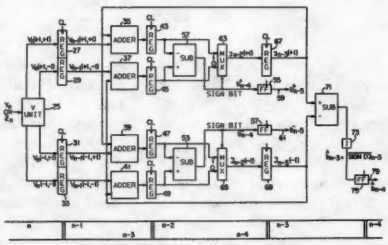
METHOD AND APPARATUS FOR DECODING THE OUTPUT SIGNAL OF A PARTIAL-RESPONSE CLASS-IV COMMUNICATION OR RECORDING-DEVICE CHANNEL

Francois B. Dolivo, Wadenswil; Gottfried Ungerboeck, Langnau, both of Switzerland, and Thomas D. Howell, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1983, Ser. No. 520,666

Int. Cl.[4] H04L *3/00*

U.S. Cl. 375—18 **3 Claims**



1. A method for decoding the output signal of a partial-response (class IV) communication or recording device channel, the signal being based on an original sequence of binary symbols $a_n = +1$ or -1, n being an integer time index, the output signal being filtered and sampled to obtain a sequence of sample values y_n, wherein the method steps for determining from the samples the most likely transmitted or recorded sequence of binary symbols comprises the steps of:

partitioning the sequence of sample values y_n into two separate sequences having even and odd time indices n, respectively; and

decoding the even and odd indexed sequences independently of each other by identical maximum-likelihood sequence detection based upon recursively determining the two surviving possibilities for the most likely sequence.

4,571,735

METHOD OF MULTI-LEVEL ENCODING INCLUDING SYNCHRONIZING SIGNALS

Anthony G. Furse, 15 Centennial Ave., Lane Cove N.S.W. 2066, Australia

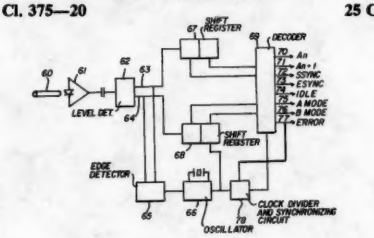
PCT No. PCT/AU82/00166, § 371 Date Jun. 7, 1983, § 102(e) Date Jun. 7, 1983, PCT Pub. No. WO83/01360, PCT Pub. Date Apr. 14, 1983

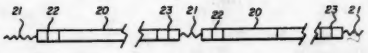
PCT Filed Oct. 8, 1982, Ser. No. 503,367

Claims priority, application Australia, Oct. 8, 1981, PF1107

Int. Cl.[4] H03K *13/24*

U.S. Cl. 375—20 25 Claims





1. A method for transmitting binary sequential data by multi-level encoding of grouped selected data bits in which a first number of data bit sequences of said grouped data bits are translated into uniquely chosen ones of a first group of level pairs of a multi-level signal and the remaining data bit sequences of said grouped data bits are translated, in a first mode of translation, into uniquely chosen ones of a second group of level pairs of said signal, and, in a second mode of translation, into uniquely chosen ones of a third group of level pairs of said signal, the mode of translation changing after the occurrence of any of one said remaining data bit sequences, characterized by the steps of:

(a) transmitting a start synchronizing signal comprising a first pair of levels of said signal not contained in said first, second or third groups;

(b) transmitting signal level pairs representative of data; and

(c) transmitting an end synchronizing signal comprising a second pair of levels of said signal not contained in said first, second or third groups.

4,571,736

DIGITAL COMMUNICATION SYSTEM EMPLOYING DIFFERENTIAL CODING AND SAMPLE ROBBING

Jagannath P. Agrawal, Lafayette, La., and Subramaniam S. Iyer, Sunnyvale, Calif., assignors to University of Southwestern Louisiana, Lafayette, La.

Filed Oct. 31, 1983, Ser. No. 547,410

Int. Cl.[4] H04L *25/16*

U.S. Cl. 375—27 22 Claims

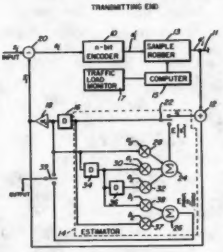
1. A method for improving the signal-to-noise ratio in a digital communication system employing a differential coder using a feedback path at a transmitter thereof for producing, where i is an interger, prediction error samples e_i from successive input data samples s_i in an input data stream and employing digital interpolation at a receiver thereof to reconstruct data samples s_i in an output data stream representative of the input samples s_i, said method comprising the steps of:

processing at the transmitter at least two successive n-bit input data samples s_i supplied thereto for producing, from a corresponding prediction error sample e_i being a linear function of at least one order of said successive n-bit input data samples, an encoded prediction error sample e_i' for transmission over a data channel,

periodically robbing from the data channel a number of encoded prediction error samples e_i' and replacing in the feedback path of the differential coder each input data sample s_i affected by said robbing by an estimated input sample $E(s_i')$, where $E(s_i')$ is a linear function of at least two orders of previously supplied input data samples s_i',

reconstructing said input data signals at the receiver by decoding successive prediction error samples e_i' transmitted over said data channel, said decoding being performed by

establishing a predicted received sample s_i on the basis of the autocorrelation function of at least one order of previously decoded samples s_i',



decoding each received data sample as $s_i' = e_i' + s_i$

estimating the received data sample $E(s_i')$ as a function of at least two previously decoded data samples s_i',

after receiving at least one additional prediction error sample e_{i+1}', . . . and decoding at least one additional data sample s_{i+1}', re-estimating the data sample $E(s_i')$ by delayed interpolation thereby to generate a re-estimated data sample $E((s_i'))$, and

replacing the decoded data sample s_i' in the output data stream with the re-estimated data sample $E((s_i'))$ thereby to reconstruct the transmitted input data signal s_i with an improved signal-to-noise ratio in the communication system.

4,571,737

ADAPTIVE DIFFERENTIAL PULSE CODE MODULATION DECODING CIRCUIT

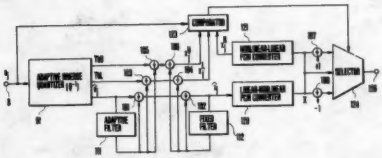
Takao Nishitani; Ichiro Kuroda, and Tadaharu Kato, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 558,236

Claims priority, application Japan, Dec. 10, 1982, 57-216710; Dec. 14, 1982, 57-218692; Feb. 21, 1983, 58-27179; Feb. 21, 1983, 58-27180; Mar. 31, 1983, 58-55442; Mar. 31, 1983, 58-55443

Int. Cl.[4] H04B *14/06*

U.S. Cl. 375—27 7 Claims



1. In an ADPCM decoding circuit of the type which receives a coded signal outputted from an ADPCM encoder which adaptively quantizes at each sampling time a residual signal which is a difference between a signal formed by linear-

izing an input nonlinear coded PCM signal and a prediction signal adaptively predicted, and which delivers a nonlinear PCM decoded signal, the improvement which comprises:

an adaptive inverse quantizer which produces, from a quantized coded signal produced by said ADPCM encoder, a representative residual value signal, a lower limit residual signal and a higher limit residual signal in accordance with said residual signal on the side of said encoder, and which determines a quantizing characteristic at a next sampling time in accordance with said quantized coded signal;

adder means adding an adaptive prediction signal to be described later to each of said representative residual value signal, said lower limit residual signal and said higher limit residual signal produced by said adaptive inverse quantizer for producing a representative decoded value signal, a lower limit decoded value signal and a higher limit decoded value signal;

a nonlinear PCM converter for converting said representative decoded value signal into a nonlinear encoded PCM signal;

a linear PCM converter linearizing said nonlinear PCM signal for producing a linear PCM signal;

comparator means for comparing said linear PCM signal with said lower limit decode value signal and with said higher limit decoded value signal;

selective addition means responsive to said comparator means for adding +1 or adding −1 or not adding to said nonlinear PCM signal to form a nonlinear PCM decoded output signal which corresponds to said nonlinear PCM signal, the nonlinear PCM signal added with +1 or the nonlinear PCM signal added with −1; and

an adaptive prediction circuit imputted with said representative decoded value signal or said representative decoded value signal together with said representative residual value signal for producing an adaptive prediction signal at a present time and for determining a prediction characteristic at a next sampling time;

whereby in a cascade connected condition in which a PCM encoding/decoding and an ADPCM encoding/decoding are repeated alternately, once internal state variable conditions of respective ADPCM encoding/decoding circuits have coincided perfectly, in the following time, degradation of the characteristic caused by the cascade connection is made to be the same as that of one ADPCM stage.

4,571,738

DEMODULATOR LOGIC FOR FREQUENCY SHIFT KEYED SIGNALS

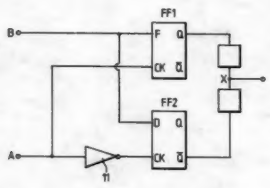
Ian A. W. Vance, Newport, England, assignor to Standard Telephones and Cables plc, London, England

Filed May 24, 1984, Ser. No. 613,426

Claims priority, application United Kingdom, Jun. 2, 1983, 8315172

Int. Cl.[4] H04L *27/14*

U.S. Cl. 375—82 **3 Claims**



1. A demodulator logic arrangement for FSK signals on an RF carrier in a direct conversion radio receiver, wherein the received signals are mixed with a local oscillator to provide quadrature baseband signals, characterised in that the demodulator logic comprises two clocked D-type flip-flops, one baseband signal being applied direct to the clock input of one flip-flop and inverted by an inverter to the clock input of the other flip-flop, the second baseband signal being applied to the D inputs of both flip-flops, means for algebraically combining one output from one flip-flop with one output from the other flip-flop to provide a demodulator signal output of the receiver, the two flip-flop outputs being chosen so that for a given FSK value they always have the same logic value.

4,571,739

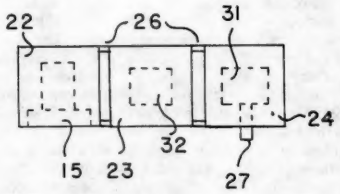
INTERORAL ELECTROLARYNX

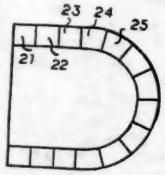
Joseph A. Resnick, Rd. #1, Box 415A, Natrona Heights, Pa. 15065

Continuation-in-part of Ser. No. 319,039, Nov. 6, 1981. This application Sep. 16, 1983, Ser. No. 533,002

Int. Cl.[4] A61F *1/20*

U.S. Cl. 381—70 **4 Claims**





1. A tone emitter for the electrical generation of a sound tone for artificial speech which tone emitter is sufficiently small in size and adopted for placement entirely within a human oral cavity and which tone emitter has a first remov-

able, artificial tooth which contains a battery power source and a second artificial tooth which contains a speaker.

4,571,740

RECREATION APPARATUS

Ronald S. Kirby, Worcester, and Richard J. Bergstrom, Shrewsbury, both of Mass., assignors to International Leisuretime Products, Inc., Shrewsbury, Mass.

Filed Oct. 3, 1983, Ser. No. 538,152

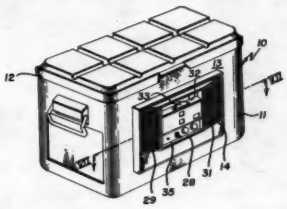
Int. Cl.[4] H04B *1/08*

U.S. Cl. 455—344 **7 Claims**

2. Recreation apparatus, comprising:

(a) an insulated container having a cover and a front wall,

(b) an auxiliary panel in which is mounted a radio and a loudspeaker said auxiliary panel being in the form of a shell that opens to the rear and has an edge in the form of a closed rectangular figure, all edges being coplanar to engage closely the outer surface of the said front wall of the container, and



(c) connecting means to join the auxiliary panel to the said front wall for separation therefrom on occasion.

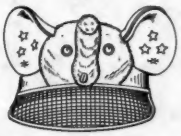
DESIGNS

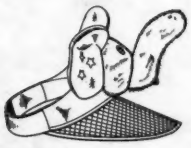
FEBRUARY 18, 1986

282,596
CHILD'S SLEEPING BAG
Heinrich Bangert, Höhenstrasse 10, 6951 Limbach, Fed. Rep. of Germany
Filed Jun. 16, 1983, Ser. No. 504,984
Term of patent 14 years
U.S. Cl. D2—25

282,597
HAT OR SIMILAR ARTICLE
Hsin-Hui Chiang, Taipei, Taiwan, assignor to Asian Star U.S.A. Inc.,, Galveston, Tex.
Filed Mar. 28, 1984, Ser. No. 594,461
Term of patent 14 years
U.S. Cl. D2—240

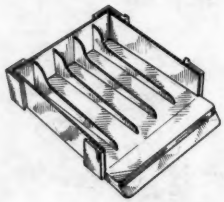
282,598
SUN VISOR OR SIMILAR ARTICLE
Hsin-Hui Chiang, Taipei, Taiwan, assignor to Asian Star U.S.A., Inc., Galveston, Tex.
Filed Mar. 28, 1984, Ser. No. 594,334
Term of patent 14 years
U.S. Cl. D2—252





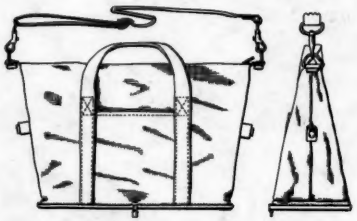
282,599
PAIR OF MOTORCYCLING BOOTS
Helmut Frey, Altenburg 5, 8330 Eggenfelden 2, Fed. Rep. of Germany
Filed Jun. 16, 1983, Ser. No. 505,079
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, MR 352
Term of patent 14 years
U.S. Cl. D2—272

282,600
STORAGE CASE FOR VIDEO FILM
Göran L. Hallengren, Landskrona, Sweden, assignor to Görhalls Försäljnings AB, Landskrona, Sweden
Filed Jul. 20, 1983, Ser. No. 515,476
Term of patent 14 years
U.S. Cl. D3—35

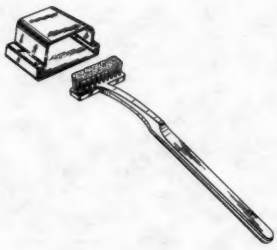


282,601
SOFT-SIDED CARRY-ON LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 31, 1983, Ser. No. 528,173
The portion of the term of this patent subsequent to Feb. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D3—71

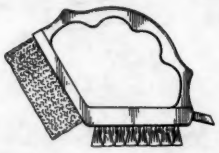
282,602
EXPANDABLE TRAVEL BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,054
Term of patent 14 years
U.S. Cl. D3—71



282,603
TOOTHBRUSH AND TOOTHBRUSH HOLDER, THEREFOR
Montorsi Piero, Bologna, Italy, assignor to The Purity Company Pty. Ltd., Sydney, Australia
Filed Nov. 21, 1983, Ser. No. 554,136
Term of patent 14 years
U.S. Cl. D4—108

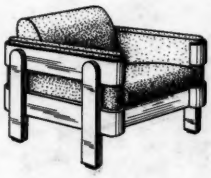


282,604
COMBINED HAND SCRUBBER AND SCRAPER
Wiley M. Whitaker, P.O. Box 466, Ramseur, N.C. 27316
Filed May 11, 1983, Ser. No. 493,590
Term of patent 14 years
U.S. Cl. D4—118

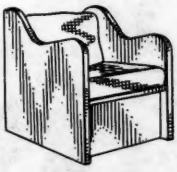


282,605
BRUSH
Cheng Mu-Jung, No. 16, Fu Chou St., Pin Tong, Taiwan
Filed Apr. 5, 1983, Ser. No. 482,228
Term of patent 14 years
U.S. Cl. D4—131

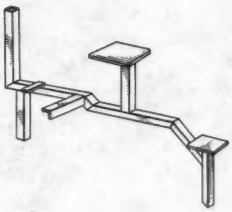
282,606
CHAIR
Robert De Fuccio, Spinnerstown, Pa., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Mar. 17, 1983, Ser. No. 476,085
The portion of the term of this patent subsequent to Jul. 16, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—334



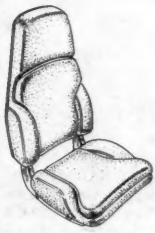
282,607
LOUNGE CHAIR
Dennis J. Palmer, 555 Irene St., Platteville, Wis. 53818
Filed May 5, 1983, Ser. No. 491,875
The portion of the term of this patent subsequent to Sep. 17, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—334



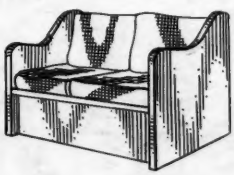
282,608
FRAME SUPPORT FOR A COMBINED SEAT AND TABLE UNIT
Scott D. Crowe, 45 Jody La., Camarillo, Calif. 93010
Filed Apr. 4, 1983, Ser. No. 481,652
The portion of the term of this patent subsequent to Jan. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—337



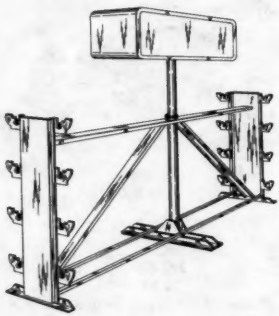
282,609
SEAT
Edward Stulik, Arcadia, Calif., assignor to Sears Manufacturing Co., Davenport, Iowa
Filed Oct. 28, 1983, Ser. No. 546,426
Term of patent 14 years
U.S. Cl. D6—356



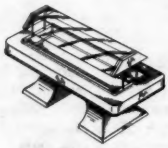
282,610
SETTEE
Dennis J. Palmer, 555 Irene St., Platteville, Wis. 53818
Filed May 5, 1983, Ser. No. 492,012
The portion of the term of this patent subsequent to Sep. 17, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—381

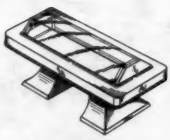


282,611
FREESTANDING DISPLAY RACK FOR ROLLED MATERIAL
James R. Seely, Rochester, Mich., assignor to Arken, Inc., Bloomfield Hills, Mich.
Filed Jul. 27, 1983, Ser. No. 517,586
Term of patent 14 years
U.S. Cl. D6—409



282,612
SALAD BAR
Franklin Moore, Jr., 902 McBurney Dr., Lebanon, Ohio 45036
Filed Nov. 17, 1983, Ser. No. 552,980
Term of patent 14 years
U.S. Cl. D6—481





282,613
TABLE
Robert De Fuccio, Spinnerstown, Pa., assignor to Simmons Universal Corporation, New York, N.Y.
Filed Mar. 17, 1983, Ser. No. 476,086
Term of patent 14 years
U.S. Cl. D6—484

282,614
DEVICE FOR RETAINING VIDEO CASSETTE BOXES IN A DISPLAY AND STORAGE RACK
Michael S. Lundh, Landskrona, Sweden, assignor to Görhalls Försäljnings AB, Landskrona, Sweden
Filed Aug. 3, 1983, Ser. No. 519,836
Claims priority, application Sweden, Feb. 14, 1983, 83-0391
Term of patent 14 years
U.S. Cl. D6—491

282,615
CUP HAVING TEA BAG POUCH
Susan H. Levine, 1370-B Berkeley Way, Berkeley, Calif. 94702
Filed Mar. 1, 1985, Ser. No. 707,222
Term of patent 14 years
U.S. Cl. D7—9

282,616

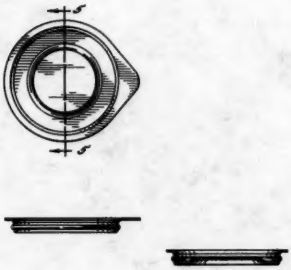
SNAP-ON LID FOR A FOOD DISH OR THE LIKE

Abigail H. Gallagher, Chicago, and Gary E. Warren, Lake Barrington, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed May 31, 1983, Ser. No. 499,249

Term of patent 14 years

U.S. Cl. D7—40



282,617

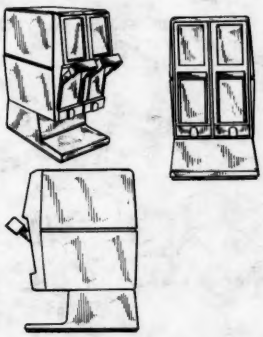
COMBINED DRESSING AND CONDIMENT DISPENSER

Lawrence R. Hogan, Lake Villa, Ill., assignor to Cole-Palmer Instrument Company, Chicago, Ill.

Filed Aug. 1, 1983, Ser. No. 518,929

Term of patent 14 years

U.S. Cl. D7—52



282,618

COFFEE BEAN ROASTER

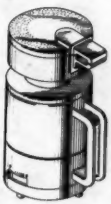
Roderick J. McBrien, Poole, England, assignor to FCF Limited, Dorset, England

Filed Jul. 13, 1983, Ser. No. 513,225

Claims priority, application United Kingdom, Jan. 14, 1983, 1010803

Term of patent 14 years

U.S. Cl. D7—323



282,619

BARBECUE GRILL

James F. Fitzgerald, Freeport; Doyle Raymer, Davis, and Charles K. Seltz, Gurnee, all of Ill., assignors to King-Seeley Thermos Company, Prospect Hts., Ill.

Filed May 14, 1984, Ser. No. 609,795

Term of patent 14 years

U.S. Cl. D7—332

282,620

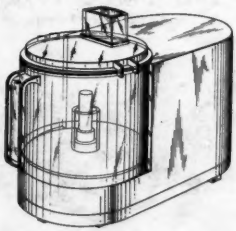
FOOD PROCESSOR

Alfredo Cavalli, 9, Via G. Galilei, Pessano Con Bornago, Milan, Italy

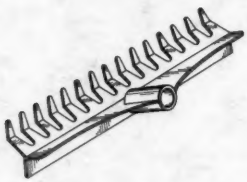
Filed Jan. 26, 1983, Ser. No. 461,212

Term of patent 14 years

U.S. Cl. D7—384

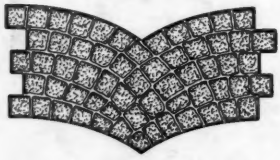


282,621
RAKE BLADE
Mikael Nuorivaara, Viikintie 16, SF-06150 Porvoo 15, Finland
Filed Oct. 19, 1983, Ser. No. 544,682
Claims priority, application Finland, Apr. 19, 1983, 373/83; Apr. 19, 1983, 374/83
Term of patent 14 years
U.S. Cl. D8—13

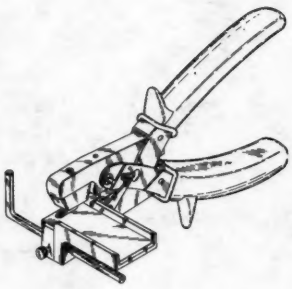


282,622
WALLPAPER HANGER
Jimmy R. Bobo, Ninth St., NE., Arab, Ala. 35016
Filed May 16, 1983, Ser. No. 495,125
Term of patent 14 years
U.S. Cl. D8—14

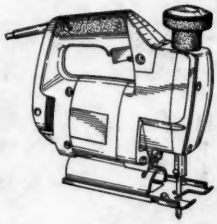
282,623
TOOL FOR IMPRINTING FISHSCALE GRANITE PATTERNS IN FRESH CONCRETE
Jonathan P. Nasvik, Picabo, Id., assignor to Bomanite Corporation, Palo Alto, Calif.
Filed Aug. 24, 1983, Ser. No. 526,093
Term of patent 14 years
U.S. Cl. D8—45



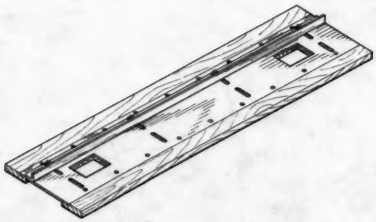
282,624
PUNCH
Ruben J. Hartmeister, 1034 6th St., Golden, Colo. 80401
Filed May 24, 1982, Ser. No. 381,200
Term of patent 14 years
U.S. Cl. D8—52



282,625
JIG SAW
William H. Schultz, Northbrook, and Kenneth N. Svetlik, Schaumburg, both of Ill., assignors to Skil Corporation, Chicago, Ill.
Filed Mar. 10, 1983, Ser. No. 473,701
Term of patent 14 years
U.S. Cl. D8—64



282,626
ADJUSTABLE PLATFORM GUIDE FOR CIRCULAR SAWS
Joseph M. Zelli, 2215 Woodland Spring, Houston, Tex. 77077
Filed Aug. 4, 1983, Ser. No. 520,473
Term of patent 14 years
U.S. Cl. D8—71

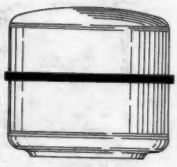


282,627
SUPPORT SPACER
Harold G. Simpson, Oklahoma City, and Juan B. Tondelli, Moore, both of Okla., assignors to Encon Products, Inc., Oklahoma City, Okla.
Filed Jan. 31, 1983, Ser. No. 462,687
Term of patent 14 years
U.S. Cl. D8—366

282,628
CLAMP FOR STORM SASHES, SCREENS OR THE LIKE
Thomas D. Kurtz, 1101 First Ave., Rock Falls, Ill. 61071
Filed Jun. 17, 1983, Ser. No. 505,335
Term of patent 14 years
U.S. Cl. D8—400

282,629
BOTTLE
Rodney A. Stafford, 57, Bushy Park Rd., Dublin 6, Ireland
Filed Aug. 18, 1982, Ser. No. 409,302
Claims priority, application Ireland, Feb. 19, 1982, 26/82
Term of patent 14 years
U.S. Cl. D9—349

282,630
JAR, OR SIMILAR ARTICLE
Morris Braun, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.
Filed Jul. 18, 1983, Ser. No. 514,645
The portion of the term of this patent subsequent to Feb. 28, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—353



282,631

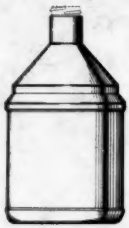
CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,486

Term of patent 14 years

U.S. Cl. D9—355



282,632

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,488

Term of patent 14 years

U.S. Cl. D9—355

282,633

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,665

Term of patent 14 years

U.S. Cl. D9—375

282,634

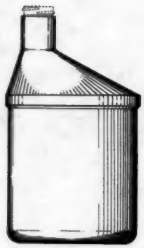
CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,666

Term of patent 14 years

U.S. Cl. D9—375



282,635

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,668

Term of patent 14 years

U.S. Cl. D9—376

282,636

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

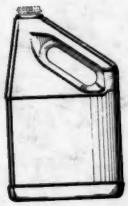
Filed Dec. 12, 1983, Ser. No. 560,702
Term of patent 14 years
U.S. Cl. D9—376

282,637

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,704
Term of patent 14 years
U.S. Cl. D9—376



282,638

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,487
Term of patent 14 years
U.S. Cl. D9—399

282,639

CONTAINER BODY FOR LIQUIDS AND THE LIKE

Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,489
Term of patent 14 years
U.S. Cl. D9—403

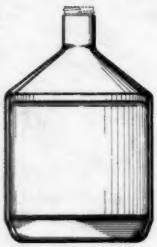
282,640

CONTAINER BODY FOR LIQUIDS AND THE LIKE

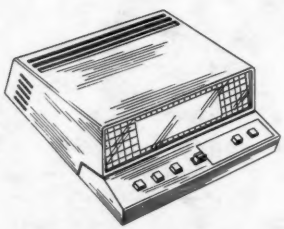
Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.

Filed Dec. 12, 1983, Ser. No. 560,490
Term of patent 14 years
U.S. Cl. D9—403

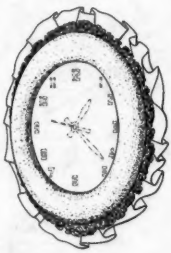
282,641
CONTAINER BODY FOR LIQUIDS AND THE LIKE
Ted L. Beaver, Roselle, and George R. Conrad, Elk Grove, both of Ill., assignors to Continental Plastic Containers, Inc., Stamford, Conn.
Filed Dec. 12, 1983, Ser. No. 560,667
Term of patent 14 years
U.S. Cl. D9—408



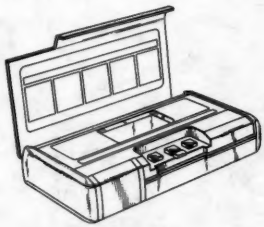
282,642
COMBINED THERMOMETER AND CLOCK
Hsieh Shu-Ken, No. 25, Lane 74, Section 3, Peh-Deh Rd., Taipei, Taiwan
Filed Oct. 14, 1983, Ser. No. 541,951
Claims priority, application Canada, Sep. 6, 1983, 06-09-83-2
Term of patent 14 years
U.S. Cl. D10—4



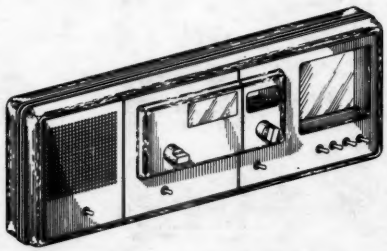
282,643
CLOCK OR SIMILAR ARTICLE
Suzanne R. Ellsworth, 6245 Rosier Rd., Canandaigua, N.Y. 14424
Filed Oct. 24, 1983, Ser. No. 544,519
Term of patent 14 years
U.S. Cl. D10—22



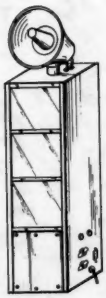
282,644
REFLECTANCE COLORIMETER
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Jun. 8, 1983, Ser. No. 502,295
Term of patent 14 years
U.S. Cl. D10—46



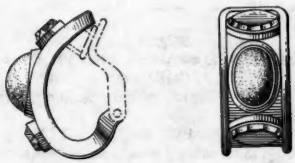
282,645
COMMUNICATION SYSTEM ANALYZER OR SIMILAR ARTICLE
Kenneth W. Larson, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 19, 1983, Ser. No. 524,726
Term of patent 14 years
U.S. Cl. D10—78



282,646
SCHOOL CAFETERIA SOUND LEVEL MONITOR
Siegmar R. Blamberg, 4 N. Cove Rd., Old Saybrook, Conn. 06475
Filed Jun. 30, 1983, Ser. No. 509,406
Term of patent 14 years
U.S. Cl. D10—114

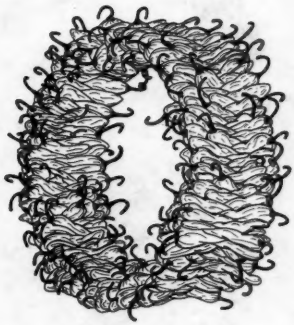


282,647
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Sep. 24, 1982, Ser. No. 422,700
Claims priority, application Italy, Jul. 30, 1982, 35962/82[U]
Term of patent 14 years
U.S. Cl. D11—40



282,648
CHAIN END INTERCONNECTING CLASP
William F. Addington, 2823 Terrace Dr., Chevy Chase, Md. 20815
Filed Sep. 21, 1983, Ser. No. 534,166
Term of patent 14 years
U.S. Cl. D11—87

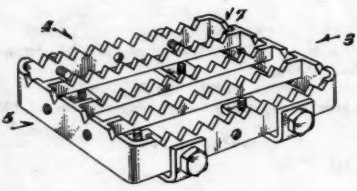
282,649
CHILE PEPPER WREATH
William R. Crinklaw, Mesa Verde Rd. #1, King City, Calif. 93930
Filed Mar. 4, 1982, Ser. No. 354,779
Term of patent 14 years
U.S. Cl. D11—120



282,650
TABLE ORNAMENT
Doreen N. Roberts, Pwllheli, Wales, assignor to Pendelfin Studios Limited, England
Filed May 10, 1984, Ser. No. 608,685
Claims priority, application United Kingdom, Nov. 17, 1983, 1 016 339
Term of patent 14 years
U.S. Cl. D11—158

282,651
TABLE ORNAMENT
Doreen N. Roberts, Pwllheli, Wales, assignor to Pendelfin Studios Limited, England
Filed May 10, 1984, Ser. No. 608,686
Claims priority, application United Kingdom, Nov. 29, 1983, 1016590
Term of patent 14 years
U.S. Cl. D11—158

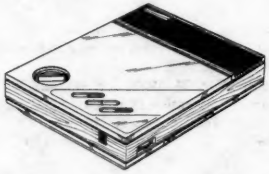
282,652
NON SLIP PEDAL COVER
Gennaro Nista, 2733 Baker Dr., Carson City, Nev. 89701
Filed Nov. 30, 1983, Ser. No. 556,402
Term of patent 14 years
U.S. Cl. D12—125



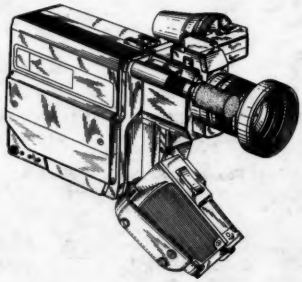
282,653
AUTOMOBILE FRONT BUMPER
Shuji Takano, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 8, 1983, Ser. No. 483,296
Term of patent 14 years
U.S. Cl. D12—169

282,654
NETWORK INTERFACE ENCLOSURE
Steven B. Perry, Highlands, and Thomas Collins, Point Pleasant, both of N.J., assignors to Keptel, Inc., Ocean, N.J.
Filed Jul. 29, 1983, Ser. No. 518,410
Term of patent 14 years
U.S. Cl. D13—41

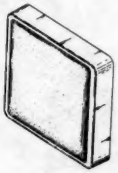
282,655
TELEPHONE ANSWERING MACHINE
Noriaki Kaku; Haruzi Nakamura; Kazuo Ishida, and Yasuhiko Tanaka, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 8, 1983, Ser. No. 559,538
Claims priority, application Japan, Jun. 17, 1983, 58-26277
Term of patent 14 years
U.S. Cl. D14—4



282,656
COMBINED VIDEO CAMERA AND VIDEO TAPE RECORDER
Akinari Mohri, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 31, 1983, Ser. No. 547,323
Claims priority, application Japan, Apr. 30, 1983, 58-18343
Term of patent 14 years
U.S. Cl. D14—5



282,657
SPEAKER GRILLE
Barry L. Caren, P.O. Box 5365, Carson, Calif. 90749
Filed Jun. 8, 1984, Ser. No. 618,686
Term of patent 14 years
U.S. Cl. D14—39



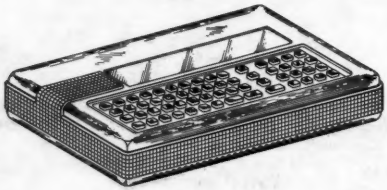
282,658
TELEPHONE HANDSET
Julian M. Abrams, Chilwell, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Dec. 14, 1983, Ser. No. 561,375
Claims priority, application United Kingdom, Jul. 1, 1983, 1013878
Term of patent 14 years
U.S. Cl. D14—63

282,659
TELEPHONE HANDSET
Julian M. Abrams, Chilwell, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Dec. 14, 1983, Ser. No. 561,378
Claims priority, application United Kingdom, Jul. 1, 1983, 1013879
Term of patent 14 years
U.S. Cl. D14—63

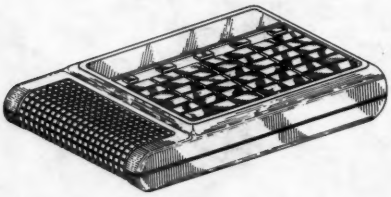
282,660
PORTABLE SCANNING RADIO RECEIVER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Nov. 4, 1983, Ser. No. 548,642
Term of patent 14 years
U.S. Cl. D14—68

282,661
PORTABLE TRANSCEIVER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Nov. 4, 1983, Ser. No. 548,643
Term of patent 14 years
U.S. Cl. D14—68

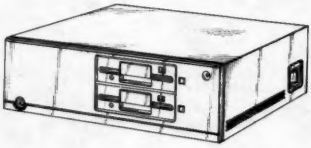
282,662
PORTABLE TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., and Randall P. Bell, Oak Park, Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 29, 1983, Ser. No. 509,263
Term of patent 14 years
U.S. Cl. D14—100



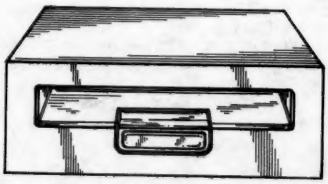
282,663
PERSONAL TWO-WAY MESSAGE TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 29, 1983, Ser. No. 509,264
Term of patent 14 years
U.S. Cl. D14—100



282,664
MICROPROCESSOR
Nobuhisa Aoyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Mar. 2, 1983, Ser. No. 471,318
Claims priority, application Japan, Sep. 3, 1982, 57-39997
Term of patent 14 years
U.S. Cl. D14—100

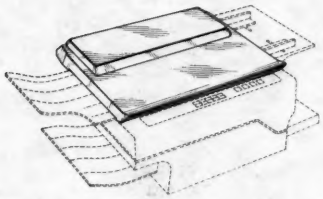


282,665
HOUSING FOR A TAPE DRIVE
Dewey M. Sims, Jr., Wayne, and Robert T. Haas, Milan, both of Mich., assignors to Northern Telecom Limited, Montreal, Canada
Filed Aug. 31, 1983, Ser. No. 528,116
Term of patent 14 years
U.S. Cl. D14—108

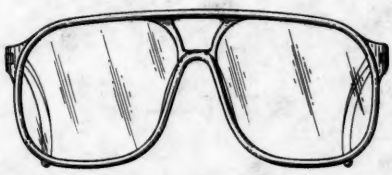


282,666
SHANK ADAPTOR FOR A ROCK DRILL
Pekka Salmi, Tampere, and Hannu Paasonen, Nokia, both of Finland, assignors to Oy Tampella AB, Tampere, Finland
Filed Mar. 11, 1983, Ser. No. 474,265
Claims priority, application Finland, Sep. 27, 1982, 847/82
Term of patent 14 years
U.S. Cl. D15—21

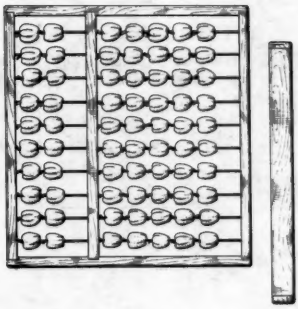
282,667
ORIGINAL FEEDER FOR ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, and Tooru Okuyamal, Isehara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Nov. 30, 1983, Ser. No. 556,687
Claims priority, application Japan, Jul. 27, 1983, 58-32682
Term of patent 14 years
U.S. Cl. D16—32



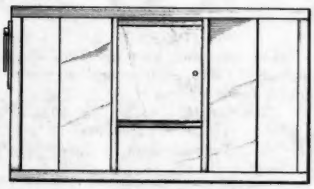
282,668
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Feb. 9, 1983, Ser. No. 465,202
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 13 088; Italy, Oct. 29, 1982, 30838 /82[U]; United Kingdom, Oct. 4, 1982, 1009068
Term of patent 14 years
U.S. Cl. D16—102

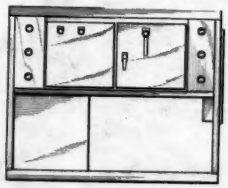


282,669
ABACUS
Carl S. Conlee, Jr., 1060 Rainbow Dr., Las Cruces, N. Mex. 88005
Filed Mar. 15, 1984, Ser. No. 589,704
Term of patent 14 years
U.S. Cl. D18—6

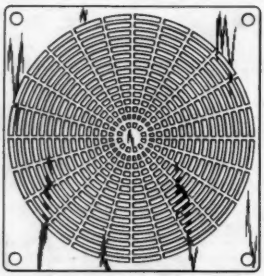


282,670
FLUID CHILLING UNIT FOR PRINTING PRESS
Robert Buenz, Jr., 4 N. 052 Kaelin Rd., West Chicago, Ill. 60185
Filed Aug. 25, 1983, Ser. No. 526,442
Term of patent 14 years
U.S. Cl. D18—22





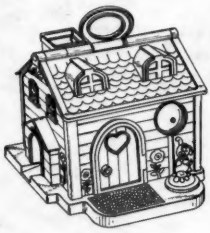
282,671
CIRCLE DRAFTING TEMPLATE
John Papsdorf, Rochester, Mich., assignor to PTL Engineering, Rochester, Mich.
Filed Nov. 21, 1983, Ser. No. 554,911
Term of patent 14 years
U.S. Cl. D19—39



282,672
BALL POINT WRITING INSTRUMENT
Jacques LeBlanc, L'Isle Adam, France; Gerald C. Herold, and E. Dale Thompson, both of Janesville, Wis., assignors to The Parker Pen Company, Janesville, Wis.
Filed Dec. 27, 1983, Ser. No. 565,722
Term of patent 14 years
U.S. Cl. D19—49

282,673
TOY RATTLE
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Susumu Matsumoto, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Nov. 16, 1983, Ser. No. 552,600
Claims priority, application Japan, May 27, 1983, 58-22551
Term of patent 14 years
U.S. Cl. D21—65

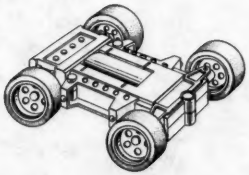
282,674
TOY COTTAGE
Claire M. Marschak, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 9, 1984, Ser. No. 578,491
Term of patent 14 years
U.S. Cl. D21—114



282,675
TOY VEHICLE
Fujio Arigaya, Tanashi, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 2, 1983, Ser. No. 548,209
Claims priority, application Japan, Jun. 1, 1983, 58-23044
Term of patent 14 years
U.S. Cl. D21—136

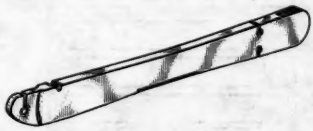
282,676
TOY VEHICLE
Timothy A. Effler, and Dale I. Goldberg, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Jan. 12, 1984, Ser. No. 570,153
Term of patent 14 years
U.S. Cl. D21—136

282,677
TOY VEHICLE CHASSIS
Fujio Arigaya, Tanashi, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Nov. 2, 1983, Ser. No. 548,225
Claims priority, application Japan, Jun. 1, 1983, 58-23043
Term of patent 14 years
U.S. Cl. D21—141

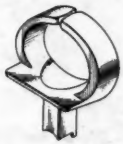


282,678
STUFFED RABBIT FIGURE
Lisa A. Cafolla, P.O. Box 86, Waterloo, N.Y. 13165
Filed Sep. 30, 1982, Ser. No. 429,384
Term of patent 14 years
U.S. Cl. D21—187

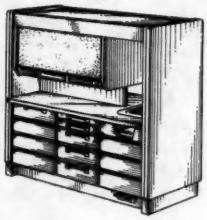
282,679
FISHING TOOL
Peter E. Wagner, 29 Augusta La., Santa Barbara, Calif. 93108
Filed Jul. 1, 1983, Ser. No. 510,065
Term of patent 14 years
U.S. Cl. D22—31



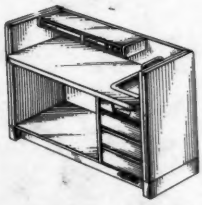
282,680
THUMB PUSHER FOR LOADING AMMUNITION INTO A MAGAZINE
Edward K. Boyles, 3528 W. 185th St., Torrance, Calif. 90504
Filed Sep. 6, 1983, Ser. No. 529,620
Term of patent 14 years
U.S. Cl. D22—99



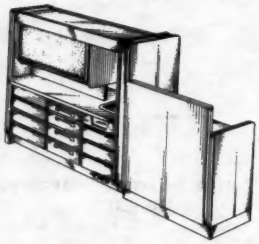
282,681
OPERATORY MODULE FOR A HEALTH TREATMENT FACILITY
Robert Case, Chicago, Ill.; Joe H. Kennedy; Randall N. Bartlett, both of Bay Minette, Ala., and James D. Alsup, Jr., Conyers, Ga., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 514,910
Term of patent 14 years
U.S. Cl. D24—4



282,682
OPERATORY MODULE FOR A HEALTH TREATMENT FACILITY
Robert Case, Chicago, Ill.; Joe H. Kennedy; Randall N. Bartlett, both of Bay Minette, Ala., and James D. Alsup, Jr., Conyers, Ga., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 514,911
Term of patent 14 years
U.S. Cl. D24—4

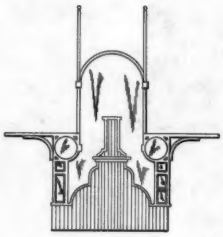


282,683
OPERATORY MODULE SYSTEM FOR A HEALTH TREATMENT FACILITY
Robert Case, Chicago, Ill.; Joe H. Kennedy; Randall N. Bartlett, both of Bay Minette, Ala., and James D. Alsup, Jr., Conyers, Ga., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jul. 18, 1983, Ser. No. 514,915
Term of patent 14 years
U.S. Cl. D24—4



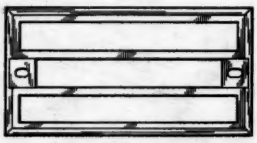
282,684
ELECTROSURGICAL PENCIL HOLSTER
Albert L. Cline, Littleton, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.
Filed Jun. 10, 1983, Ser. No. 503,388
Term of patent 14 years
U.S. Cl. D24—29

282,685
RESTAURANT BUILDING
James Franklin; William E. Palmer, and Keith Seabolt, all of Chattanooga, Tenn., assignors to Victory Lane, Inc., Cleveland, Tenn.
Filed Apr. 8, 1983, Ser. No. 483,275
Term of patent 14 years
U.S. Cl. D25—18

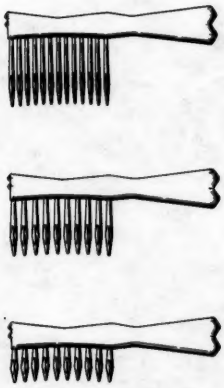


282,686
PENLIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Nov. 10, 1983, Ser. No. 550,444
Claims priority, application United Kingdom, May 12, 1983, 1013003
Term of patent 14 years
U.S. Cl. D26—49

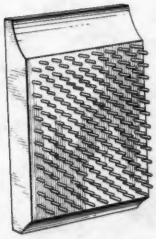
282,687
GRILLE FOR VEHICLE LIGHT FIXTURE
Gordon E. McMahon, 7400 NW. 31st., Oklahoma City, Okla. 73008
Filed Jun. 6, 1983, Ser. No. 501,177
Term of patent 14 years
U.S. Cl. D26—139



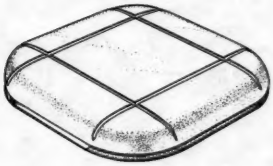
282,688
COMB
Franklin D. Harvey, 22 E. Broad St., Richmond, Va. 23219
Filed Jul. 10, 1984, Ser. No. 629,405
Term of patent 14 years
U.S. Cl. D28—31



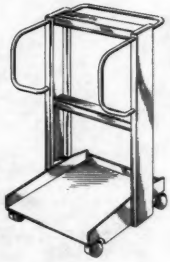
282,689
BACK SCRATCHER
Diane G. McCormick, 9330 Edmonston Rd., #202, Greenbelt, Md. 20770
Filed Sep. 9, 1982, Ser. No. 416,519
Term of patent 14 years
U.S. Cl. D28—63



282,690
CASE FOR COSMETICS OR THE LIKE
Pietro Legrottaglie, Novate Milanese, Italy, assignor to ROC S.A., Colombes, France
Filed Aug. 26, 1983, Ser. No. 526,891
Claims priority, application France, Mar. 28, 1983, DMA/000185
Term of patent 14 years
U.S. Cl. D28—83



282,691
CART
Richard M. Latino, Holden, Mass., assignor to Wright Line Inc., Worcester, Mass.
Filed Jun. 10, 1983, Ser. No. 502,919
The portion of the term of this patent subsequent to Feb. 11, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—21



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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF FEBRUARY, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Kozak, William G., 4,571,306, Cl. 252-351.000.

A. H. Robins Company, Incorporated: *See—*
Teng, Lina C., 4,571,393, Cl. 514-210.000.

A/S Ferrosan: *See—*
Christensen, Jorgen A.; and Everland, Peer, 4,571,424, Cl. 546-236.000.

AB Akerlund & Rausing: *See—*
Pollack, Zoltan; and Svard, Bengt, 4,571,472, Cl. 219-9.500.

AB Dentatus: *See—*
Edwardson, Svante R., 4,571,184, Cl. 433-166.000.

AB Stil-Industri: *See—*
Haglund, Lennart, 4,571,471, Cl. 200-61.58B.

Abe, Hideo: *See—*
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Coin sorting device. 4,570,779, Cl. 194-318.000.

Abe, Masaharu: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Abe, Shinya: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.

Abell, Creed W.; and Denney, Richard M., to University of Texas System Board of Regents, The. Hybrid cell lines producing monoclonal antibodies directed against neurotransmitter degrading enzymes. 4,571,381, Cl. 435-7.000.

Abersold, Larry A.: *See—*
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Abram, Trevor S.; Norman, Peter; and Warren, Brian T., to Miles Laboratories, Inc. Anti-allergic chromone- or thiochromone-5-oxamic acid derivatives, compositions, and method of use therefor. 4,571,405, Cl. 514-437.000.

Ackerman, Richard; Hurlbut, Donovan H.; and Jewer, Alan A., to News Log International, Inc. Digital data record. 4,571,713, Cl. 369-44.000.

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Knokey, Charles R.; and Bedi, Paul S., 4,570,449, Cl. 62-183.000.

Acme-Cleveland Corporation: *See—*
Crosby, Robert J., 4,571,501, Cl. 307-252.00R.

Acme United Corporation: *See—*
MacConkey, James S.; and Melville, Douglas F., Jr., 4,570,627, Cl. 128-132.00D.

Acorn Building Components, Inc.: *See—*
DiFazio, Joseph, 4,570,406, Cl. 52-656.000.

A'Costa, Anthony. Flash suppressor for firearms having rifled barrels. 4,570,529, Cl. 89-14.200.

Adachi, Masakazu, to Otsuka Pharmaceutical Co., Ltd. Process for determining tumor-associated glycolinkage and method for diagnosis of cancer. 4,571,382, Cl. 435-7.000.

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Adams, Charles W., to R. A. Jones & Co. Inc. Carton squaring mechanism. 4,571,236, Cl. 493-319.000.

Adams, Harold P., Jr. Oil level sensor system and method for oil wells. 4,570,718, Cl. 166-369.000.

Adams Plastics, Inc.: *See—*
Simpson, Roy G., 4,570,424, Cl. 54-23.000.

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Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,571,240, Cl. 604-96.000.

Ae, Osamu: *See—*
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.

Aeroquip Corporation: *See—*
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,570,981, Cl. 285-332.300.
Rogers, Russell L., 4,570,657, Cl. 137-39.000.

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Agence Spatiale Europeenne: *See—*
Cameron, Richard J., 4,571,563, Cl. 333-212.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Sauerteig, Wolfgang; Ranz, Erwin; and Schutz, Heinz, 4,571,378, Cl. 430-505.000.

AGFA-Gevaert, N.V.: *See—*
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Smyth, Richard E., 4,570,934, Cl. 273-143.00R.

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Johnson, David E.; Abersold, Larry A.; and McCall, Kenneth E., 4,571,478, Cl. 219-69.00R.

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Kaneko, Kenichi; Hirashiba, Yuji; Kawai, Shinji; and Suzuki, Koichi, 4,570,274, Cl. 4-443.000.
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Akae, Yoshifumi: *See—*
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Inoue, Takashi, 4,570,761, Cl. 188-78.000.

Akers, Roy, to Bell & Howell Company. Envelope stacking arrangement for mail sorting machines. 4,570,922, Cl. 271-178.000.

Akimoto, Hiroshi: *See—*
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Akse, James R., to North American Philips Corporation. Method for strengthening terminations on reduction fired multilayer capacitors. 4,571,276, Cl. 156-89.000.

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Koizumi, Yutaka; and Akutsu, Eiichi, 4,571,057, Cl. 355-3.00R.

Alas, Jacques; and Bacher, Michel, to Valeo. Clutch with reaction plate in two parts, especially for motor vehicles. 4,570,772, Cl. 192-70.180.

Albany International Corp.: *See—*
Dutt, William H., 4,571,359, Cl. 428-240.000.

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Alberts, Heinrich: *See—*
Thoma, Wilhelm; Pisaric, Karl H.; and Alberts, Heinrich, 4,571,417, Cl. 525-63.000.

Albrecht, Konrad: *See—*
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Grimes, Roger, 4,571,272, Cl. 148-11.50A.

Alexander, Stephen R.: *See—*
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Allied Corporation: *See*—
Anderson, Bruce W.; and Chambers, Warren D., 4,570,531, Cl. 92-52.000.
Antonazzi, Frank J., 4,570,490, Cl. 73-701.000.
Carmichael, Richard W.; and Nosse, John G., 4,571,007, Cl. 303-7.000.
Gongwer, Calvin A., 4,571,192, Cl. 440-66.000.
Taig, Alistair G., 4,570,734, Cl. 180-79.100.
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Yew, Kwang; and Mitchell, Ron, 4,570,902, Cl. 251-129.150.

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Dushenko, Michael D.; Castner, Harvey R.; Baugh, Robert T.; and Shupert, Paul T., 4,570,806, Cl. 211-191.000.

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Allo, Vincent F.: *See*—
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,570,702, Cl. 165-159.000.

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Fukuda, Kazuo, 4,571,644, Cl. 360-90.000.
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Pugnet, Gerard, 4,570,706, Cl. 166-77.500.

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Schell, James E., deceased; Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., 4,571,291, Cl. 204-213.000.

Aluminum Company of America: *See*—
Walton, Mark D., 4,571,544, Cl. 324-58.50R.

Amano Corporation: *See*—
Hidemi, Komine; and Hiroshi, Kato, 4,571,490, Cl. 235-384.000.

Amari, Akira: *See*—
Takeo, Seiji; and Amari, Akira, 4,571,103, Cl. 400-616.200.

American Hoechst Corporation: *See*—
Culbertson, E. C.; and Farrar, Grover L., 4,571,363, Cl. 428-332.000.

AMP Incorporated: *See*—
Fujita, Yukihisa, 4,571,017, Cl. 339-59.00M.
Meyer, David L.; and Wolfe, Brian A., 4,570,326, Cl. 29-566.300.
Mueller, Arthur L., 4,571,015, Cl. 339-17.0CF.

Amrath, Hans, to TRW Ehrenreich GmbH & Co. KG. Ball joint. 4,571,110, Cl. 403-141.000.

Amsler, Jerry D.; and Furrow, Robert E. Measuring apparatus. 4,570,348, Cl. 33-129.000.

AMSTED Industries Incorporated: *See*—
Willson, David H., 4,571,302, Cl. 210-791.000.

An-Rix, Inc.: *See*—
Goldstein, Leon C., 4,571,277, Cl. 156-96.000.

Andersen, Michael A.: *See*—
Zaruba, John V.; Andersen, Michael A.; and Meyer, Burton C., 4,571,210, Cl. 446-424.000.

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Riley, Dennis P.; Anderson, Mark M.; and Rotruck, John T., 4,571,391, Cl. 514-4.000.

Anderson, Stanley E.; and Franklin, Leonard N., Jr., to General Motors Corporation. Demand responsive flow control valve. 4,570,662, Cl. 137-117.000.

Anderson, William D., to RCA Corporation. Luminance peaking filter for use in digital video signal processing systems. 4,571,620, Cl. 358-166.000.

Andoh, Toshihiro; Kondo, Tatsuya; and Toguchi, Akira, to Sanyo Electric Co., Ltd. Tape end detecting device. 4,570,876, Cl. 242-188.000.

Andover Medical Incorporated: *See*—
Gomes, Robert L.; and Maffione, Joseph P., 4,570,637, Cl. 128-639.000.

Andreasson, Bo C., to Aktiebolaget Electrolux. Ignition device of an i.c. engine. 4,570,595, Cl. 123-418.000.

Angeloff, Lloyd G., to Grumman Aerospace Corporation. Wind turbine yaw stabilizer. 4,571,155, Cl. 416-13.000.

Annoot, Ira R., to Houston Geophysical Products, Inc. Seismic marsh T-coupler with removable polarized connectors. 4,571,018, Cl. 339-60.00R.

Annovi, Giuseppe, to Dolomite, S.p.A. Ski boot with a normalized sole. 4,570,363, Cl. 36-117.000.

Anthony, William H.: *See*—
Fenoglio, John C.; Wilbur, David L.; and Anthony, William H., 4,571,368, Cl. 428-654.000.

Antonazzi, Frank J., to Allied Corporation. Differential pressure ratio measurement system. 4,570,490, Cl. 73-701.000.

Antos, John M.; and Selina, John, to Thetford Corporation. Portable toilet pourspout. 4,570,273, Cl. 4-321.000.

Aoki, Hisao, to Sanden Corporation. Method for coating aluminum metal body with aluminum alloy brazing filler metal. 4,571,352, Cl. 427-431.000.

Aoki, Takashi: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Aoki, Takashi, 4,570,770, Cl. 192-0.052.

Aoyagi, Katsuhiko: *See*—
Kashihara, Tomio; and Aoyagi, Katsuhiko, 4,571,688, Cl. 364-477.000.

Aoyama, Keizo: *See*—
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, 4,571,510, Cl. 307-449.000.

Appel, Bette J., to Bette Appel, Inc. Unisex torso garment with sleeves. 4,570,267, Cl. 2-91.000.

Applied Magnetics Corporation: *See*—
Reid, James; and Roberts, Gary E., 4,571,651, Cl. 360-113.000.

Aprea, George F.; and Pohle, Werner P., to Wm. Steinen Mfg. Co. 180° Nozzle body having a solid cone spray pattern. 4,570,860, Cl. 239-478.000.

Arabian, Sandro; Baumann, Manfred; and Besserer, Walter, to CWS AG. Soap solution dispenser including indicator means for indicating the filling state thereof. 4,570,823, Cl. 222-26.000.

Arai, Junichi, to Mitsubishi Denki Kabushiki Kaisha. Connecting terminal. 4,571,019, Cl. 339-276.00R.

Arai, Kozo, to Japan Synthetic Rubber Co., Ltd. Method and unit for inspecting printed wiring boards. 4,571,542, Cl. 324-158.00P.

Arai, Tetsuji; and Mimura, Yoshiki, to Ushio Denki Kabushiki Kaisha. Heating method of semiconductor wafer. 4,571,486, Cl. 219-354.000.

Arakawa, Noriyuki: *See*—
Sakagami, Teruo; Shoji, Masuhiro; Arakawa, Noriyuki; and Murayama, Naohiro, 4,571,390, Cl. 502-402.000.

Arakawa, Satoshi; Yamazaki, Hisashi; Yamazaki, Kikuo; and Matsuda, Terumi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,571,496, Cl. 250-484.100.

Arata, Tadao: *See*—
Tanaka, Shinsaku; and Arata, Tadao, 4,571,647, Cl. 360-105.000.

Archer, David. Child proof cap having tamper means. 4,570,809, Cl. 215-220.000.

Arditty, Herve : *See*—
Papuchon, Michel; Arditty, Herve ; Graindorge, Philippe; and Huignard, Jean-Pierre, 4,571,080, Cl. 356-345.000.

Arendt, Hans F. Rotary coupling for a plurality of independent fluids. 4,570,978, Cl. 285-131.000.

Ariizumi, Shoji: *See*—
Iwahashi, Hiroshi; and Ariizumi, Shoji, 4,571,706, Cl. 365-200.000.

Arinaga, Kuniomi, to Unitta Co., Ltd. Belt drive system. 4,571,224, Cl. 474-153.000.

Arla: *See*—
Olenfalk, Lars; and Delbou, Tor, 4,570,983, Cl. 285-355.000.

Armbruster, George E., to Illinois Bell Telephone Company. Communication cable support system. 4,570,884, Cl. 248-68.100.

Armor Electric Company, Inc.: *See*—
Tsai, George C.; and Benstsen, Svend J., 4,570,755, Cl. 187-29.00R.

Armstrong, Donald R., to Hugh J. Baker and Company. Treadle control. 4,570,777, Cl. 192-134.000.

Armstrong, Lee R., to RCA Corporation. Workpiece alignment system. 4,570,530, Cl. 89-41.050.

Armstrong, Orin R. Apparatus and system for remote timing of plural entities. 4,571,698, Cl. 364-569.000.

Arnold, Frank. Calibrated tubular elastic exercising device. 4,570,921, Cl. 272-137.000.

Arnold, John D., to Belleview Pharmaceutical, Inc. Dihydrocodeine/ibuprofen pharmaceutical compositions and method. 4,571,400, Cl. 514-282.000.

Asada, Akiyoshi: *See*—
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, 4,571,285, Cl. 204-1.00T.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Hirai, Isamu, 4,571,047, Cl. 354-403.000.
Sugawara, Saburo, 4,571,048, Cl. 354-403.000.
Suzuki, Koji; and Tano, Eiichi, 4,571,046, Cl. 354-400.000.

Asahi Seiko Kabushiki Kaisha: *See*—
Abe, Hiroshi, 4,570,779, Cl. 194-318.000.

Asano, Kiyomitsu: *See*—
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.

ASEA Aktiebolag: *See*—
Kollberg, Sten, 4,570,698, Cl. 164-498.000.

Ashlock, Lysander T.; Mukamal, Harold; and White, William H., to Swedlow, Inc. Transparent, abrasion resistant coating compositions. 4,571,365, Cl. 428-412.000.

AT&T Bell Laboratories: *See*—
Lisco, Richard J., 4,571,506, Cl. 307-311.000.
Matheson, Thomas G., 4,570,930, Cl. 273-1.00E.
Olsson, Nils A.; and Patel, Chandra K. N., 4,571,576, Cl. 340-347.0AD.
Robin, Max S.; Tamburro, Peter J.; and Weiss, Roger E., 4,571,014, Cl. 339-14.00R.

AT&T Technologies, Inc.: *See*—
Ignatowicz, Alexander M., 4,570,338, Cl. 29-845.000.

AT&T Teletype Corporation: *See*—
Jung, Werner; and Purzycki, Alfred Z., 4,571,104, Cl. 400-616.300.

Atkins, Terrance J.; Field, Martin J.; and Nolan, Daniel, to General Motors Corporation. Fuel rail assembly and method of fabrication. 4,570,600, Cl. 123-468.000.

Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., to General Motors Corporation. Fuel rail. 4,570,602, Cl. 123-468.000.

Atlantic Richfield Company: *See—*
Fenoglio, John C.; Wilbur, David L.; and Anthony, William H., 4,571,368, Cl. 428-654.000.
Schraufnagel, Richard A., 4,571,300, Cl. 210-761.000.
Shelton, Walter W., 4,571,174, Cl. 432-14.000.
Younes, Usama E., 4,571,418, Cl. 525-148.000.

Atlas Copco Aktiebolag: *See—*
Granstrom, Bengt P. O.; and Skogberg, Bo T., 4,571,126, Cl. 405-244.000.

Auerbach, Abraham: *See—*
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, 4,571,322, Cl. 264-154.000.

August Reutershan GmbH. & Co. KG: *See—*
Pracht, Gunther, 4,570,512, Cl. 81-3.290.

Austin, Stephen R.: *See—*
Moseley, John F.; and Austin, Stephen R., 4,571,139, Cl. 414-347.000.

Automobilove Zavody, narodni podnik: *See—*
Babak, Jan, 4,570,510, Cl. 74-805.000.

Avery, Richard J., Jr. Method and apparatus for extracting liquid from a vapor compression refrigeration system. 4,570,458, Cl. 62-503.000.

Avions Marcel Dassault-Breguet: *See—*
Dupin, Gerard, 4,570,879, Cl. 244-122.0AF.

AVM, Inc.: *See—*
Dodson, Daniel P.; and Ludwig, George C., 4,570,912, Cl. 267-64.150.

Azumi, Ichiro: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Azusawa, Noboru; and Shiraishi, Hisayoshi, to Hitachi, Ltd. Apparatus and method for controlling a thyristor converter in response to change in mode of load current. 4,571,668, Cl. 363-81.000.

B.E.L.-Tronics Limited: *See—*
Martinson, Glen D., 4,571,593, Cl. 343-783.000.

B. F. Goodrich Company, The: *See—*
Kramer, James H., 4,570,315, Cl. 29-149.50S.
Morrison, Thomas E., 4,570,786, Cl. 198-842.000.

Baader, Edward J. Small motor assembly. 4,571,515, Cl. 310-42.000.

Baba, Masatoshi: *See—*
Taniguchi, Masakazu; Baba, Masatoshi; Ochini, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, 4,571,397, Cl. 514-252.000.

Babak, Jan, to Automobilove Zavody, narodni podnik. Gearing mechanism, particularly for seat with adjustable back rest. 4,570,510, Cl. 74-805.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Kato, Yasuyoshi; Konishi, Kunihiko; and Ohta, Masao, 4,571,329, Cl. 423-239.000.

Bacher, Michel: *See—*
Alas, Jacques; and Bacher, Michel, 4,570,772, Cl. 192-70.180.

Bachmann, Urs, to Sulzer Brothers Limited. System for conditioning textile material in a weaving machine. 4,570,682, Cl. 139-1.00C.

Badawi, Amr: *See—*
Lusignan, Bruce B.; Sytwu, James; and Badawi, Amr, 4,571,723, Cl. 370-110.200.

Baer, James W.: *See—*
Romano, Paul M.; Baer, James W.; and Hargarten, James W., 4,571,712, Cl. 369-44.000.

Baer, Ralph H., to Sanders Associates, Inc. Video disc program branching system. 4,571,640, Cl. 358-342.000.

Bagarov, Stefan T.: *See—*
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.

Baglioni, Alessandro, to Medosan Industrie Biochimiche Riunite S.p.A. 7-(1-Methyl-5-p-methylbenzoylpyrrole-2-acetamidoethyl)-theophylline with anti-platelet aggregant and broncholytic activity. 4,571,399, Cl. 514-265.000.

Bahr, Adolf J. Coin counting apparatus. 4,570,654, Cl. 133-1.00A.

Bair, James G., Jr.: *See—*
Richter, John M.; and Bair, James G., Jr., 4,570,385, Cl. 51-165.710.

Baker International Corporation: *See—*
Almond, Charles B.; and Leonard, James S., 4,571,282, Cl. 162-47.000.

Bakhshi, Shiv K.: *See—*
Klett, Paul A.; Bakhshi, Shiv K.; and Granger, Mark A., 4,570,859, Cl. 239-455.000.

Bakker, Peter, to Koninklijke Eijsbouts Klokkengieterij En Fabriek Van Torenuurwerken B.V. Keyboard for a carillon. 4,570,528, Cl. 84-423.00R.

Balenseifen, Jack W. Orthodontic appliance. 4,571,179, Cl. 433-20.000.

Balinski, Henry A.: *See—*
Slager, Richard E.; and Balinski, Henry A., 4,570,400, Cl. 52-235.000.

Balken, Jochen; Krude, Werner; and Orain, Michel A., to Uni-Cardan Aktiengesellschaft. Bearing assembly for wheel hub driven by a universal joint. 4,571,099, Cl. 384-513.000.

Ballantyne, David B., to General Motors Corporation. Dual control mechanism for a remotely located mirror. 4,570,893, Cl. 248-487.000.

Balmer, Oskar: *See—*
Focke, Heinz; and Balmer, Oskar, 4,570,414, Cl. 53-373.000.

Baluch, Donald T.; and Zimmerman, Paton M., Jr., to General Motors Corporation. Method and apparatus for producing polymer articles having different properties in different regions of the articles. 4,571,319, Cl. 264-40.100.

Bamji, Pervez J. F.; and Fitzpatrick, Nigel P., to Alcan International Limited. Recovery of aluminium scrap. 4,571,258, Cl. 75-10.00R.

Banasiak, Dennis S.: *See—*
Byers, Jim D.; and Banasiak, Dennis S., 4,571,438, Cl. 568-420.000.

Banich, John N., Sr.: *See—*
Lecinski, Frank H.; and Banich, John N., Sr., 4,570,811, Cl. 215-343.000.

Banister, Gerald K. Quick-connect mount for a camera and tripod. 4,570,887, Cl. 248-187.000.

Barbato, Michael W.; Rhodes, Tony; and Watts, Edward W., to Mattel, Inc. Animated figure holder toy. 4,571,198, Cl. 446-73.000.

Barbie, Paul E.: *See—*
Lengenfelder, William G., Jr.; and Barbie, Paul E., 4,571,225, Cl. 474-176.000.

Barbieri, Bruno, to Cavallino S.N.C. Prodotti Chimici. Product in tablet form for use in the chemical elimination of soot from chimneys and smoke ducts. 4,571,247, Cl. 44-5.000.

Bares, Jan, to Xerox Corporation. Housing seal. 4,571,060, Cl. 355-3.0DD.

Barkalow, Clare E., to Michigan Instruments, Inc. Cardiopulmonary resuscitator massager pad. 4,570,615, Cl. 128-28.000.

Barlow, John, to GKN Technology Limited. Method of squeeze forming metal articles. 4,570,693, Cl. 164-112.000.

Barnett, Allen M., to University of Delaware. Thin film photovoltaic solar cell and method of making the same. 4,571,448, Cl. 136-259.000.

Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,571,308, Cl. 260-112.50R.

Barr, John D.: *See—*
Matthias, Terry R.; and Barr, John D., 4,570,725, Cl. 175-329.000.

Barsa, John E. Sensory monitoring apparatus and method. 4,570,640, Cl. 128-741.000.

Barski, Guy, to Cii Honeywell Bull. Device for loading the main body of a platform containing at least one read/write transducer of a data medium. 4,571,648, Cl. 360-105.000.

Bartel, Mark H.: *See—*
Bintner, Dennis W.; Ryan, Joseph B., Jr.; and Bartel, Mark H., 4,570,858, Cl. 239-390.000.

Barton, Bruce C.: *See—*
Ewers, Ronald L.; and Barton, Bruce C., 4,570,973, Cl. 280-800.000.

BASF Aktiengesellschaft: *See—*
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Baskin, Ronald J.: *See—*
Lieber, Richard L.; and Baskin, Ronald J., 4,570,641, Cl. 128-774.000.

Bassler, Max; and Dambach, Philip J., to Molex Incorporated. Shielded electrical connector assembly. 4,571,012, Cl. 339-14.00R.

Batelka, Joseph J., to Union Camp Corporation. Multi-scored tab slip sheets. 4,570,546, Cl. 108-51.100.

Battelle Development Corporation: *See—*
Sump, Kenneth R., 4,570,271, Cl. 623-18.000.

Battelle Memorial Institute: *See—*
McGinniss, Vincent D.; and Schwerzel, Robert E., 4,571,377, Cl. 430-81.000.

Batty, John R., Jr.: *See—*
Slocum, Chester D.; and Batty, John R., Jr., 4,571,589, Cl. 340-870.320.

Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., to Iomega Corporation. Magnetic disk drive having a movable drive motor. 4,571,646, Cl. 360-99.000.

Baugh, Robert T.: *See—*
Dushenko, Michael D.; Castner, Harvey R.; Baugh, Robert T.; and Shupert, Paul T., 4,570,806, Cl. 211-191.000.

Baum, Heinz O.: *See—*
Richmond, John F.; Mauer, Dieter; and Baum, Heinz O., 4,570,303, Cl. 24-16.0PB.

Baum, Wendell E., to Cosco Industries, Inc. Razor blade holder. 4,570,342, Cl. 30-162.000.

Baumaire, Alain; Desmas, Thierry; and Vambenepe, Guy, to Service National Electricite de France. Apparatus for detecting the evolution of an acoustic signal. 4,570,489, Cl. 73-658.000.

Bauman, Jack. Laryngoscope with disposable blade and light conductor. 4,570,614, Cl. 128-11.000.

Baumann, Manfred: *See—*
Arabian, Sandro; Baumann, Manfred; and Besserer, Walter, 4,570,823, Cl. 222-26.000.

Baus, Heinz G. Massaging device. 4,570,617, Cl. 128-52.000.

Bausch & Lomb Incorporated: *See—*
Esmay, Edward N., 4,571,037, Cl. 350-507.000.

Baxley, Grover B. Floating fish receptacle. 4,570,374, Cl. 43-55.000.

Bayer Aktiengesellschaft: *See—*
Thoma, Wilhelm; Pisaric, Karl H.; and Alberts, Heinrich, 4,571,417, Cl. 525-63.000.
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,570,622, Cl. 128-90.000.

Bayerische Motoren Werke AG: *See—*
Melzer, Harald; and Hahn, Joachim, 4,570,334, Cl. 29-700.000.

Bays, David E.: *See—*
Hayes, Roger; Bays, David E.; and MacKinnon, John W. M., 4,571,394, Cl. 514-212.000.

BBC Brown, Boveri & Company, Limited: *See—*
Weber, Jurg, 4,571,154, Cl. 415-158.000.

Beardmore, John M., to General Motors Corporation. Fuel pump with integral accumulator. 4,571,159, Cl. 417-366.000.

Becker, Neil J.: *See*—
Skupnjak, Joseph A.; Lee, Douglas J.; and Becker, Neil J., 4,571,709, Cl. 365-233.000.

Beckman, John H.; and Nausedas, Joseph A., to Union Carbide Corporation. Stuffing horn clean out. 4,570,301, Cl. 17-49.000.

Becton Dickinson and Company: *See*—
O'Connell, James P.; and Sage, Burton H., Jr., 4,571,388, Cl. 436-63.000.

Bedi, Paul S.: *See*—
Knokey, Charles R.; and Bedi, Paul S., 4,570,449, Cl. 62-183.000.

Bee Chemical Co.: *See*—
Jarzombek, Richard E.; and Moeller, Raymond J., 4,571,416, Cl. 524-474.000.

Beecham Group Limited: *See*—
Howarth, Thomas T.; and Luk, King, 4,571,392, Cl. 514-210.000.

Beecham Group p.l.c.: *See*—
Evans, John M.; and Cassidy, Frederick, 4,571,406, Cl. 514-456.000.

Beglinger, Gregory O.; Massof, Edward P.; and Schwind, Richard J., to Phillips Plastics Corporation. Two-piece plastic fastener and apparatus for molding same. 4,571,134, Cl. 411-41.000.

Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, to Kaltenbach & Voigt GmbH & Co. Arrangement for carrying dental implements. 4,571,182, Cl. 433-79.000.

Beier, Stefan; and Gmeinder, Hermann, to Kaltenbach & Voigt GmbH & Co. Switching arrangement for the control of the control elements of a dental treatment location. 4,571,681, Cl. 364-413.000.

Belbel, Elie; Haury, Andree ; Blanchard, Christian; and Lauraire, Michel, to La Telemecanique Electrique. Controlled opening and closing switch with automatic opening in the event of current overload. 4,571,565, Cl. 335-16.000.

Bell, Frank H., to Morton Thiokol. Inc. LOVA Type black powder propellant surrogate. 4,570,540, Cl. 102-202.000.

Bell & Howell Company: *See*—
Akers, Roy, 4,570,922, Cl. 271-178.000.
Thompson, Callie R., 4,570,916, Cl. 270-52.500.

Bell Industries, Inc.: *See*—
Kaye, Peter D., 4,570,674, Cl. 137-624.180.

Bell, Malcolm E. Precision alignment apparatus. 4,570,343, Cl. 33-1.00M.

Belleview Pharmaceutical, Inc.: *See*—
Arnold, John D., 4,571,400, Cl. 514-282.000.

Bellinger, Gary R. Universal animal grooming post. 4,570,577, Cl. 119-102.000.

Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., to Data I/O Corporation. System for testing digital logic devices. 4,571,724, Cl. 371-25.000.

Beloit Corporation: *See*—
Kirchner, Edward C., 4,570,862, Cl. 241-28.000.

Belokin, Martin P., to Martin Paul, Inc. Adhesive tape dispensing holder. 4,570,837, Cl. 225-42.000.

Bemm, Wulf; Bruckner, Rolf; and Eigelshofen, Gunter, to Neiman S.A. Device for locking the rotational movement of a steering column of a motor vehicle. 4,570,468, Cl. 70-252.000.

Bendiberica S.A.: *See*—
Ferret Bofill, Joaquim; and Para Joan, Josep, 4,570,759, Cl. 188-73.320.

Benedikt, George M. Ring-opened polynorbornene negative photoresist with bisazide. 4,571,375, Cl. 430-197.000.

Benjamin, James A.; Lade, Robert W.; Schutten, Herman P.; and Jaskolski, Stanley V., to Eaton Corporation. High density, high voltage power FET. 4,571,606, Cl. 357-23.400.

Benjamin, James A.: *See*—
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,571,513, Cl. 307-577.000.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,571,512, Cl. 307-577.000.

Benkovics, Laszlo : *See*—
Ferenczi, Gyorgy; Boda, Janos; Toth, Ferenc; Horvath, Peter; Benkovics, Laszlo ; and Dozsa, Laszlo , 4,571,541, Cl. 324-158.00D.

Bennett, Anthony B. Plural branch locking cable. 4,570,465, Cl. 70-18.000.

Bennett, R. James, to Westinghouse Electric Corp. System for adaptively adjusting radar receiver attenuation. 4,571,590, Cl. 343-7.0AG.

Benoit, Gordon L., to Mobil Oil Corporation. Methods for preparing flat-bottom thermoplastic sack and systems therefore. 4,571,235, Cl. 493-195.000.

Benstsen, Svend J.: *See*—
Tsai, George C.; and Benstsen, Svend J., 4,570,755, Cl. 187-29.00R.

Berard, Clement A., Jr.: *See*—
Dischert, Robert A.; Meise, William H.; and Berard, Clement A., Jr., 4,571,511, Cl. 307-547.000.

Berg, Franco, to Rittal-Werk Rudolf Loh GmbH & Co. KG. Bearing bracket for mounting a bearing shaft to a mounting strip. 4,570,889, Cl. 248-220.200.

Berger, Robert P. Dental thickness gauge. 4,571,181, Cl. 433-72.000.

Bergstrom, Richard J.: *See*—
Kirby, Ronald S.; and Bergstrom, Richard J., 4,571,740, Cl. 455-344.000.

Berlese, Remo. Racing glove. 4,570,269, Cl. 2-161.00A.

Besserer, Walter: *See*—
Arabian, Sandro; Baumann, Manfred; and Besserer, Walter, 4,570,823, Cl. 222-26.000.

Beton, Gordon: *See*—
Colanzi, Franco; and Beton, Gordon, 4,571,227, Cl. 474-199.000.

Bette Appel, Inc.: *See*—
Appel, Bette J., 4,570,267, Cl. 2-91.000.

Bettencourt, Darryl G.; and Bettencourt, Thomas S., to Blackwelders. Tomato harvester with improved separation of tomatoes from other picked up material. 4,570,426, Cl. 56-327.00R.

Bettencourt, Thomas S.: *See*—
Bettencourt, Darryl G.; and Bettencourt, Thomas S., 4,570,426, Cl. 56-327.00R.

Bierwith, Robert S. Digging tooth and bucket lip construction. 4,570,365, Cl. 37-141.00T.

Bigelow, John E.: *See*—
Stein, Charles R.; and Bigelow, John E., 4,571,585, Cl. 340-784.000.

Billeter, Henry R., deceased (by Billeter, Lucille, administratrix), to Sloan Valve Company. Truck mounted air cylinder and slack adjuster. 4,570,763, Cl. 188-196.00D.

Billeter, Lucille, administratrix: *See*—
Billeter, Henry R., deceased, 4,570,763, Cl. 188-196.00D.

Binder, Rudolf: *See*—
Gmeiner, Gunter; Hugger, William; and Binder, Rudolf, 4,570,989, Cl. 296-97.00J.

Binding, Gary J.: *See*—
Houseman, David G.; and Binding, Gary J., 4,570,943, Cl. 277-12.000.

Bingham, Grady A., to Thermal Concepts, Inc. Earth-type heat exchanger for heat pump systems. 4,570,452, Cl. 62-260.000.

Bingham, John; and Oliver, Allen W., to International Standard Electric Corporation. Integrated service multiplex equipment. 4,571,722, Cl. 370-106.000.

Bintner, Dennis W.; Ryan, Joseph B., Jr.; and Bartel, Mark H., to Delavan Corporation. Coated spray nozzle tips. 4,570,858, Cl. 239-390.000.

Bio Mechanisms, Inc.: *See*—
Kock, Ronald W.; and Schuster, Charles E., 4,570,925, Cl. 272-67.000.

Biogenesis, Inc.: *See*—
Knighton, David R., 4,571,244, Cl. 604-118.000.

Biondi, Carlo: *See*—
Frascaroli, Francesco; and Biondi, Carlo, 4,570,408, Cl. 52-726.000.

BioResearch Inc.: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,570,620, Cl. 128-80.00A.

Birchak, James R.; and Lygas, Edward A., to NL Industries, Inc. Acoustic device for measuring fluid properties. 4,571,693, Cl. 364-509.000.

Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, to Institut Francais du Petrole. Process and device for hydroconversion of hydrocarbons. 4,571,326, Cl. 422-207.000.

Bitzer, Rainer, to Robert Bosch GmbH. Electronically controlled screwdriver with quality check indicator. 4,571,696, Cl. 364-552.000.

Black, Laura E.; and Boucher, Heather A., to Exxon Research and Engineering Co. Process for separating alkylaromatics from aromatic solvents and the separation of the alkylaromatic isomers using membranes. 4,571,444, Cl. 585-819.000.

Blackmore, Andrew, to Ceeco Machinery Manufacturing Limited. Twin track buncher. 4,570,428, Cl. 57-58.650.

Blackwelders: *See*—
Bettencourt, Darryl G.; and Bettencourt, Thomas S., 4,570,426, Cl. 56-327.00R.

Blain, Edward S.: *See*—
Kintz, Lawrence J., Jr.; and Blain, Edward S., 4,571,518, Cl. 310-68.00R.

Blake, Andy F.: *See*—
Gould, Charles M.; and Blake, Andy F., 4,570,663, Cl. 137-119.000.

Blanchard, Christian: *See*—
Belbel, Elie; Haury, Andree ; Blanchard, Christian; and Lauraire, Michel, 4,571,565, Cl. 335-16.000.

Blank, Michael G.; and Hammerschmidt, Horst E., to Maschinenfabrik Koppern GmbH & Co. KG. Multiple injection moulding apparatus. 4,571,171, Cl. 425-533.000.

Blascyk, Gotthardt: *See*—
Gudat, Gerhard; Blascyk, Gotthardt; and Wingenfeld, Friedrich, 4,571,176, Cl. 432-226.000.

Blatt, Leland F. Power operated clamp. 4,570,914, Cl. 269-32.000.

Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., to Kartridg Pak Co., The. Portable polisher and buffs therefor. 4,570,278, Cl. 15-97.00R.

Blose, Thomas L.; and Chelette, K. Darrel, to Hydril Company. Tubular joint with trapped mid-joint metal-to-metal seal. 4,570,982, Cl. 285-334.000.

BMI, Inc.: *See*—
Dudro, Harry R., Jr.; and Morris, Frank E., 4,571,318, Cl. 264-30.000.

Board of Regents, University of Texas System: *See*—
Ranney, David F., 4,571,087, Cl. 366-108.000.

Bock, Erich; Hammer, Helmut; and Postler, Gunther, to Diehl GmbH & Co. Safety device for ground impact detonators in fragmentation ammunition. 4,570,541, Cl. 102-216.000.

Boda, Janos: *See*—
Ferenczi, Gyorgy; Boda, Janos; Toth, Ferenc; Horvath, Peter; Benkovics, Laszlo ; and Dozsa, Laszlo , 4,571,541, Cl. 324-158.00D.

Bodson, Charles D.: *See*—
Schaphorst, Richard A.; and Bodson, Charles D., 4,571,632, Cl. 358-260.000.

Boeckh, Franz-Xaver: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.
Boeing Company, The: *See*—
Elrod, Samuel D., 4,571,355, Cl. 428-102.000.
Wright, Dale E., 4,571,084, Cl. 356-391.000.
Boelens, David A. Rotary drain cleaner. 4,570,281, Cl. 15-104.3SN.
Bogle, Hugh A.; and Buchanan, Charles E., to Roan Industries, Inc. Process for a disposal of waste solutions. 4,571,175, Cl. 432-14.000.
Bogoyavlensky, Vladimir F.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Bohac, Frank J., Jr., to Hughes Aircraft Company. Nonvolatile latch. 4,571,704, Cl. 365-156.000.
Boire, Maxime: *See*—
Martin, Joel; and Boire, Maxime, 4,571,135, Cl. 411-85.000.
Boitiaux, Jean-Paul: *See*—
Cosyns, Jean; and Boitiaux, Jean-Paul, 4,571,442, Cl. 585-261.000.
Boiting, Hans-Herrmann: *See*—
Rachner, Hans-Gunther; and Boiting, Hans-Herrmann, 4,570,552, Cl. 110-347.000.
Boliden Aktiebolag: *See*—
Buren, Kurt J. A.; Hedlund, Martin L.; and Lundstrom, Malkolm S., 4,571,261, Cl. 75-77.000.
Johansson, Leif; Petersson, Stig A.; and Rudling, Bengt O., 4,571,260, Cl. 75-21.000.
Bolling, Yvonne. Doorbell actuated air freshener. 4,570,824, Cl. 222-39.000.
Bonasso, Jack I.; Harper, James T.; and Verhoff, Francis K., to Bonasso, Jack I.; and Harper, James T. Apparatus for the conversion of coal to gas, liquid and solid products. 4,571,249, Cl. 48-73.000.
Bond, Raymond G., to T.A.D. Avanti, Inc. Telephone answering system with additional message storage capabilities. 4,571,458, Cl. 179-6.110.
Bonniaud, Roger; Jouan, Antoine; and Hery, Yves, to Commissariat a l'Energie Atomique. Process for conditioning radioactive waste. 4,571,307, Cl. 252-628.000.
Borden, Charles D.: *See*—
Tourville, David A.; and Borden, Charles D., 4,570,939, Cl. 273-253.000.
Borden, Inc.: *See*—
Capitao, Manuel, Jr., 4,570,794, Cl. 206-394.000.
Boroloy Industries International, Inc.: *See*—
Hansen, Michael S., 4,571,215, Cl. 464-180.000.
Borst, Rodney D.; and Mohs, Thomas J., to Placon Corporation. Reclosable container with label bridge. 4,570,818, Cl. 220-339.000.
Borzone, Rocco R.: *See*—
Ellison, Arthur E.; and Borzone, Rocco R., 4,570,623, Cl. 128-92.00B.
Bothner, Carl R., to Eastman Kodak Company. Cleaning apparatus and method for a polychromatic electrophotographic copier. 4,571,071, Cl. 355-15.000.
Boucher, Armand, to Joseph E. Seagram & Sons, Inc. Reduced alcohol wine and its manufacture. 4,570,534, Cl. 99-277.000.
Boucher, Heather A.: *See*—
Black, Laura E.; and Boucher, Heather A., 4,571,444, Cl. 585-819.000.
Boudewijns, Arnoldus J. J., to U.S. Philips Corporation. Television camera with a solid-state pick-up device. 4,571,625, Cl. 358-213.000.
Boulton, Thomas W., to Imperial Chemical Industries PLC. Process for the electrolysis of aqueous alkali metal chloride solution. 4,571,288, Cl. 204-98.000.
Bourbeau, Arthur J., Jr.; and Doherty, John P., to Honeywell Information Systems Inc. System and method for making changes to printed wiring boards. 4,571,072, Cl. 355-79.000.
Bourdeau, Romeo G.: *See*—
Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,571,317, Cl. 264-29.100.
Boussois S.A.: *See*—
Taupin, Pierre; Goguillon, Claude; and de Moncuit, Frederic, 4,571,577, Cl. 340-347.00R.
Bouvet, Jean V.: *See*—
Henry, Raymond; Heitzmann, Michel; and Bouvet, Jean V., 4,571,559, Cl. 333-17.00L.
Bouwhuis, Gijsbertus: *See*—
Haisma, Jan; and Bouwhuis, Gijsbertus, 4,571,616, Cl. 358-88.000.
Bowler, Edward F., Jr., to Xerox Corporation. Post-fuser copy sheet decurler. 4,571,054, Cl. 355-3.0SH.
Boxkes, Werner: *See*—
Muller, Wolfgang H. E.; Boxkes, Werner; and Scholten, Heinz, 4,571,284, Cl. 203-14.000.
Brandenstein, Manfred; Haas, Roland; Hans, Rudiger; and Friedrich, Wolfgang, to SKF Kugellagerfabriken GmbH. Tension roller for belt drive. 4,571,222, Cl. 474-112.000.
Brandenstein, Manfred: *See*—
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,570,773, Cl. 192-98.000.
Brandt, Randy. Wide band transistor oscillator. 4,571,557, Cl. 331-96.000.
Branick Industries, Inc.: *See*—
Schoener, Gilbert P., 4,570,514, Cl. 81-129.000.
Brannen, Ralph L. Document handling machine. 4,570,801, Cl. 209-534.000.
Braun Aktiengesellschaft: *See*—
Durr, Helmut, 4,570,499, Cl. 74-44.000.
Braun, Anton: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.
Braun, Ernst; and Braun, Gert, to Halbach & Braun Industrieanlagen. Mechanism for controlling the elevation of a coal planer. 4,571,004, Cl. 299-34.000.
Braun, Gert: *See*—
Braun, Ernst; and Braun, Gert, 4,571,004, Cl. 299-34.000.
Braun, Richard R.; and Cedar, Charles E., to L & M Radiator, Inc. Support for heat exchanger tubes. 4,570,704, Cl. 165-162.000.
Brazdil, James F., Jr.: *See*—
Ward, Michael D.; Brazdil, James F., Jr.; and Grasselli, Robert K., 4,571,290, Cl. 204-157.690.
Breden, Charles R.; and Danielczyk, Zygmunt, to Daniel Corporation. Bicycle transmission. 4,571,219, Cl. 474-70.000.
Breglia, Denis R.; and Patz, Benjamin W., to United States of America, Navy. CIG Distortion correction with delay lines. 4,571,631, Cl. 358-231.000.
Breslow, Jeffrey D.: *See*—
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,570,938, Cl. 273-243.000.
Bresowar, Gerald E.: *See*—
Ferguson, William B., Jr.; Bresowar, Gerald E.; and Wheeler, Louis B., 4,571,311, Cl. 261-64.00B.
Bridges, William G., to Olin Corporation. Air classification in a spray grainer. 4,570,567, Cl. 118-64.000.
Brie, Richard; and Guidoux, Loic B. Y., to Radioelectriques et 501 Telecommunications. Echo canceller for a baseband data signal. 4,571,465, Cl. 179-170.200.
Brief, John D. Barbless fishhook. 4,570,373, Cl. 43-43.160.
Brigade Quartermasters, Ltd.: *See*—
Williams, George, 4,570,688, Cl. 150-134.000.
British Columbia Research Council: *See*—
Bruynesteyn, Albert; Hackl, Ralph P.; Lawrence, Richard W.; and Vizsolyi, Andrew I., 4,571,387, Cl. 435-262.000.
British Petroleum Company p.l.c., The: *See*—
Dolden, John G.; Fogg, Sidney G.; and Lidy, Werner A., 4,571,413, Cl. 524-199.000.
Griggs, Colin G., 4,571,289, Cl. 204-157.900.
Broman, William G.: *See*—
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.
Brooks, William A., Jr. Recreational apparatus. 4,571,195, Cl. 441-74.000.
Broscoff, Mary E.: *See*—
Tackett, Edd; and Broscoff, Mary E., 4,571,170, Cl. 425-458.000.
Brother Industries, Ltd.: *See*—
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Ueno, Hideo; and Kurokawa, Yuji, 4,571,100, Cl. 400-17.000.
Brown, Russell L.; Bryant, George M.; and Cunningham, Charles J., to Union Carbide Corporation. Foam composition used in paper treatment. 4,571,360, Cl. 428-318.400.
Brown, Thomas H., to Smith Kline & French Laboratories Limited. Cytosine derivatives having histamine H_2-antagonist activity. 4,571,398, Cl. 514-259.000.
Brown, William C., to Raytheon Company. Phase-locked magnetron system. 4,571,552, Cl. 330-47.000.
Bruckner, Rolf: *See*—
Bemm, Wulf; Bruckner, Rolf; and Eigelshofen, Gunter, 4,570,468, Cl. 70-252.000.
Brudny, Joseph: *See*—
Silverman, Gordon; and Brudny, Joseph, 4,571,682, Cl. 364-413.000.
Bruin, Nicholas A.: *See*—
Martin, Harvey G.; and Bruin, Nicholas A., 4,570,548, Cl. 109-66.000.
Brunner, Thomas: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.
Bruns, Ann St. John, executrix: *See*—
Bruns, Carl H., deceased, 4,570,516, Cl. 83-455.000.
Bruns, Carl H., deceased (by Bruns, Ann St. John, executrix), to Minnesota Mining and Manufacturing Company. Mat board cutter with wear adjustable cutter-carrying body. 4,570,516, Cl. 83-455.000.
Brunson, Welton K.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,571,245, Cl. 604-179.000.
Bruynesteyn, Albert; Hackl, Ralph P.; Lawrence, Richard W.; and Vizsolyi, Andrew I., to British Columbia Research Council. Biological-acid leach process. 4,571,387, Cl. 435-262.000.
Bryant, George M.: *See*—
Brown, Russell L.; Bryant, George M.; and Cunningham, Charles J., 4,571,360, Cl. 428-318.400.
BTR plc: *See*—
Goward, Stanley H., 4,570,980, Cl. 285-305.000.

Buchanan, Charles E.: *See—*
Bogle, Hugh A.; and Buchanan, Charles E., 4,571,175, Cl. 432-14.000.

Buchner, Hans. Standing wave interferometer for measuring optical path differences. 4,571,083, Cl. 356-358.000.

Budd Company, The: *See—*
Sherrow, Lionel, 4,570,545, Cl. 105-354.000.

Buggele, Norman R.: *See—*
Lewanski, Richard M.; and Buggele, Norman R., 4,570,785, Cl. 198-628.000.

Buhler, Ulrich; Stahl, Theo; Mix, Konrad; and Roth, Kurt, to Cassella Aktiengesellschaft. Process for the production of discharge resist prints on hydrophobic textile materials: hydrogen sulphide salt, polysulpane or thiolate. 4,571,246, Cl. 8-456.000.

Bull, William T. Nailing gun. 4,570,840, Cl. 227-8.000.

Buluschek, Bruno E., to Maillefer S.A. Automatic traversing control. 4,570,875, Cl. 242-158.00R.

Bunge, Lothar P. Collet assembly. 4,571,132, Cl. 409-234.000.

Buren, Kurt J. A.; Hedlund, Martin L.; and Lundstrom, Malkolm S., to Boliden Aktiebolag. Method for recovering lead from waste lead products. 4,571,261, Cl. 75-77.000.

Burfiend, George. Multiple axle stabilizing system. 4,570,970, Cl. 280-680.000.

Burgess, Steven M.: *See—*
Suh, Nam P.; and Burgess, Steven M., 4,571,358, Cl. 428-155.000.

Burk, Robert G., to Incom International Inc. Large bearing area power transmission and material handling chain. 4,571,229, Cl. 474-231.000.

Burke, Inc.: *See—*
Kramer, DuWayne E., 4,570,739, Cl. 180-216.000.

Burke, Thomas A.; and Scheuerman, Curtis H., to Parker-Hannifin Corporation. Flow dividing valve. 4,570,668, Cl. 137-512.200.

Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Length or angle measuring device. 4,570,346, Cl. 33-125.00R.

Burkholder, Harvey Z., to USI Agri-Business Company Inc. Cage door for easy one-hand operation. 4,570,574, Cl. 119-17.000.

Burmeister, Harland A.; and Weinig, Lee A., to Kimberly-Clark Corporation. Positioning apparatus for treatment device. 4,570,518, Cl. 83-504.000.

Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., to International Business Machines Corporation. Data processor having multiple-buffer adapter between a system channel and an input/output bus. 4,571,671, Cl. 364-200.000.

Burns, David C.: *See—*
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., 4,571,645, Cl. 360-98.000.

Burr, Roland R.: *See—*
Gregorious, David J.; Wilcox, Roger F.; and Burr, Roland R., 4,570,842, Cl. 228-48.000.

Burrington, James D.: *See—*
DiCosimo, Robert; Burrington, James D.; and Grasselli, Robert K., 4,571,443, Cl. 585-428.000.

Burroughs Corporation: *See—*
Gottlieb, G. Eugene, 4,571,093, Cl. 374-57.000.
Kocot, Raymond H., 4,571,597, Cl. 346-75.000.

Burroughs Wellcome Co.: *See—*
Peck, Anthony W., 4,571,395, Cl. 514-221.000.

Burtelson, Frederick W.: *See—*
Suffi, Louis; and Burtelson, Frederick W., 4,571,013, Cl. 339-14.00R.

Burton, James A.; and Lee, Richard B., to Hydril Company. Mechanical connector apparatus. 4,570,977, Cl. 285-39.000.

Buteux, Patrick; and Buteux, Pierre. Method of implanting hair on a sheet support. 4,570,559, Cl. 112-266.200.

Buteux, Pierre: *See—*
Buteux, Patrick; and Buteux, Pierre, 4,570,559, Cl. 112-266.200.

Butt, Sheldon H., to Olin Corporation. Method of assembling a chip carrier. 4,570,337, Cl. 29-840.000.

B.V. Enraf-Nonius Delft: *See—*
Stoffels, Johannes, 4,571,095, Cl. 374-167.000.

B.V. Korthofah: *See—*
de Groot, Jacobus H., 4,570,537, Cl. 101-35.000.

Byers, Jim D.; and Banasiak, Dennis S., to Phillips Petroleum Company. Process for preparing olefinic aldehydes and chemical intermediates. 4,571,438, Cl. 568-420.000.

Byrne, Edmund F.; and Tolman, Glen L., to Medi-Physics, Inc. Homocysteine and homocysteinamide derivatives. 4,571,430, Cl. 560-148.000.

Byrns, Edson: *See—*
Huenniger, Edward A.; and Byrns, Edson, 4,570,455, Cl. 62-475.000.

C.O.M. Cooperativa Operai Metallurgici s.c.r.l.: *See—*
Frascaroli, Francesco; and Biondi, Carlo, 4,570,408, Cl. 52-726.000.

C. R. Bard, Inc.: *See—*
Klein, Richard B.; and Scavuzzo, William S., 4,571,242, Cl. 604-111.000.

Cable, Harold E.; and Rodrigues, Anil N., to Weld Tooling Corporation. Ribbon rail systems. 4,570,542, Cl. 104-119.000.

Cadbury Schweppes, PLC: *See—*
Jeans, Edward L., 4,570,830, Cl. 222-185.000.

Cage, James K.; Kolla, Shanti; and Gates, Jan E., to Hunt-Wesson Foods, Inc. Container and popcorn ingredient for microwave use. 4,571,337, Cl. 426-107.000.

Cahill, Steven P.; and Covington, Roger G., to Eastman Kodak Company. Optical disk cartridge and cooperating apparatus. 4,571,718, Cl. 369-291.000.

California Institute of Technology: *See—*
Anderson, Dana Z., 4,571,085, Cl. 356-445.000.

Calvet, Jean: *See—*
Allemand, Louis R.; Calvet, Jean; Cavan, Jean-Claude; Goldwasser, Maurice; and Thevenin, Jean-Claude, 4,571,313, Cl. 264-1.500.

Cameron, Richard J., to Agence Spatiale Europeenne. Integrated microwave filter and method of constructing same. 4,571,563, Cl. 333-212.000.

Campbell, David N., to Hymatic Engineering Company Limited, The. Cryogenic cooling apparatus. 4,570,457, Cl. 62-514.0JT.

Campbell, Loyal E. Drinking mug. 4,570,454, Cl. 62-457.000.

Campbell, Nickie G.: *See—*
Campbell, William O.; and Campbell, Nickie G., 4,570,808, Cl. 215-11.00R.

Campbell, William O.; and Campbell, Nickie G., to Campbell, William O.; and Campbell, Nickie G. Baby bottle with integral handle. 4,570,808, Cl. 215-11.00R.

Canadian Patents & Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee: *See—*
Wyslouzil, Walter; and Kashyap, Satish C., 4,571,473, Cl. 219-10.55A.

Caneschi, Mario; and Tadini, Giorgio, to Ing. C. Olivetti & C., S.p.A. Digital image information compression and decompression method and apparatus. 4,571,634, Cl. 358-261.000.

Cann, Bruce J.: *See—*
Smith, Gilbert C.; and Cann, Bruce J., 4,570,291, Cl. 16-250.000.

Canon Kabushiki Kaisha: *See—*
Fujiki, Makoto; and Takayama, Makoto, 4,571,641, Cl. 360-19.100.
Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.
Kato, Masatake, 4,571,031, Cl. 350-426.000.
Kato, Masatake; Kitagishi, Nozomu; and Hattori, Jun, 4,571,033, Cl. 350-427.000.
Minoura, Kazuo; and Tateoka, Masamichi, 4,571,021, Cl. 350-6.800.
Momiyama, Kikuo, 4,571,050, Cl. 354-429.000.
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, 4,571,725, Cl. 371-25.000.
Saitoh, Keishi, 4,571,370, Cl. 430-57.000.
Someya, Atsushi; and Suda, Shigeyuki, 4,571,032, Cl. 350-427.000.
Urawa, Motoo; Takenouchi, Masanori; Kan, Fumitaka; Suematsu, Kohshi; and Imai, Eiichi, 4,571,372, Cl. 430-122.000.
Yamashita, Masataka, 4,571,369, Cl. 430-56.000.
Yashiki, Yuichi, 4,571,371, Cl. 430-62.000.

Capitao, Manuel, Jr., to Borden, Inc. Suspension packaging for film rolls. 4,570,794, Cl. 206-394.000.

Capps, Rodney D., II. Quick disassembly flowcell. 4,571,078, Cl. 356-246.000.

Caray, Andre ; and Renaud, Pierre, to Valeo. Clutch plate assembly with improved coupling between a hub and a friction disc thereof. 4,570,775, Cl. 192-106.200.

Cardinal Industries, Inc.: *See—*
Dannemiller, Timothy J., 4,570,403, Cl. 52-295.000.

Cargill Detroit Corporation: *See—*
Cargill, Don A.; and Fisher, Lee K., 4,570,782, Cl. 198-345.000.

Cargill, Don A.; and Fisher, Lee K., to Cargill Detroit Corporation. Non-synchronous rotary manufacturing system. 4,570,782, Cl. 198-345.000.

Carl Freudenberg, Firma: *See—*
Kawamura, Miichiro; and Fujihashi, Mitsuru, 4,570,311, Cl. 28-164.000.

Carl Schmale GmbH & Co. KG: *See—*
Freermann, Johannes, 4,570,557, Cl. 112-147.000.

Carlingswitch, Inc.: *See—*
Sorenson, Richard W.; and Ives, Milton N., 4,571,467, Cl. 200-6.0BA.

Carlo, James T.: *See—*
Hornbeck, Larry J.; Nelson, William E.; and Carlo, James T., 4,571,603, Cl. 346-160.000.

Carlqvist, Bengt R.; and Svensson, Lars T. E., to Telefonaktiebolaget L M Ericsson. FIR-Type balance filter incorporated in the transmitter-receiver unit in a telecommunication system. 4,571,719, Cl. 370-32.000.

Carmichael, Richard W.; and Nosse, John G., to Allied Corporation. Proportioning relay valve. 4,571,007, Cl. 303-7.000.

Carmien, Joseph A. Reinforced tool handle and method of manufacturing same. 4,570,988, Cl. 294-57.000.

Carpenter, Jerry A.: *See—*
Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., 4,571,090, Cl. 366-270.000.

Carr, Jack, to Roseman Mower Corporation. Hydraulically operated gang mower trailer. 4,570,425, Cl. 56-7.000.

Carrier Corporation: *See—*
Huenniger, Edward A.; and Byrns, Edson, 4,570,455, Cl. 62-475.000.
Ripka, Chester D.; Friedman, James N.; and Drago, Thomas E., 4,570,612, Cl. 126-360.00A.

Cars & Concepts, Inc.: *See—*
Draper, David L., 4,570,321, Cl. 29-401.100.

Carsonite International Corporation: *See—*
Schmanski, Donald W., 4,571,118, Cl. 404-10.000.

Case Western Reserve University: *See—*
Liu, Chung-Chiun; and Karagounis, Vasilios A., 4,571,292, Cl. 204-412.000.

Caskey, Douglas C.; and Chapman, Douglas W., to Mallinckrodt, Inc. Process for preparing p-aminophenol and alkyl substituted p-aminophenol. 4,571,437, Cl. 564-418.000.
Cassella Aktiengesellschaft: *See—*
Buhler, Ulrich; Stahl, Theo; Mix, Konrad; and Roth, Kurt, 4,571,246, Cl. 8-456.000.
Cassidy, Frederick: *See—*
Evans, John M.; and Cassidy, Frederick, 4,571,406, Cl. 514-456.000.
Cassidy, Michael F.: *See—*
Meiser, Sue M.; and Cassidy, Michael F., 4,570,936, Cl. 273-157.00R.
Castera, Jean-Paul, to Thomson-CSF. Tunable selective devices based for magnetostatic volume waves. 4,571,562, Cl. 333-186.000.
Castner, Harvey R.: *See—*
Dushenko, Michael D.; Castner, Harvey R.; Baugh, Robert T.; and Shupert, Paul T., 4,570,806, Cl. 211-191.000.
Caswell, Kennith, to National Research Development Corporation. Vehicle steering mechanisms. 4,570,965, Cl. 280-426.000.
Caterpillar Tractor Co.: *See—*
Fair, Jack E., 4,570,568, Cl. 118-69.000.
Theobald, Michael R., 4,570,503, Cl. 74-360.000.
Cattadoris, Joseph M. Holding and marking fixture for flat sheets. 4,570,345, Cl. 33-32.00G.
Cavallino S.N.C. Prodotti Chimici: *See—*
Barbieri, Bruno, 4,571,247, Cl. 44-5.000.
Cavan, Jean-Claude: *See—*
Allemand, Louis R.; Calvet, Jean; Cavan, Jean-Claude; Goldwasser, Maurice; and Thevenin, Jean-Claude, 4,571,313, Cl. 264-1.500.
Cedar, Charles E.: *See—*
Braun, Richard R.; and Cedar, Charles E., 4,570,704, Cl. 165-162.000.
Ceeco Machinery Manufacturing Limited: *See—*
Blackmore, Andrew, 4,570,428, Cl. 57-58.650.
Cefin S.p.A.: *See—*
Pazzaglia, Luigi, 4,571,476, Cl. 219-61.300.
Centeno, Edward M., to Mann Packing Co., Inc. Vegetable banding apparatus. 4,570,415, Cl. 53-399.000.
Center Line Industries, Inc.: *See—*
Mears, Lawrence N., 4,570,371, Cl. 42-90.000.
Cerceo, Chris A.: *See—*
Kaufman, Martin H.; Cerceo, Chris A.; and Kaufman, Jeanie F., 4,570,282, Cl. 15-167.00R.
Chadwick, Victor J., to Plessey Overseas Limited. Sonar apparatus. 4,571,711, Cl. 367-88.000.
Chaitin, Gregory J., to International Business Machines Corporation. Register allocation and spilling via graph coloring. 4,571,678, Cl. 364-300.000.
Chambers, Allan K.: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,571,094, Cl. 374-29.000.
Chambers, Warren D.: *See—*
Anderson, Bruce W.; and Chambers, Warren D., 4,570,531, Cl. 92-52.000.
Champion International Corporation: *See—*
Wysocki, Lawrence S., 4,570,844, Cl. 229-16.00D.
Champion Spark Plug Europe S.A.: *See—*
Verton, Jose , 4,570,284, Cl. 15-250.420.
Chandra, Tapan K.; and Major, Jonathan C., to Texaco Inc. Boat landing stage for marine platform. 4,571,123, Cl. 405-212.000.
Chang, Long F.; and Steele, Scott W., to Owens-Illinois, Inc. Method for thermally conditioning a thermoplastic preform. 4,571,173, Cl. 432-9.000.
Chang, Robert C.: *See—*
Leitch, Paul A.; Chang, Robert C.; and Thompson, Randy E., 4,570,389, Cl. 51-325.000.
Chanock, Robert M.: *See—*
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.
Chaplin, Neale A., to Powell Duffryn Engineering Limited. Hydraulic fluid supply systems. 4,570,661, Cl. 137-115.000.
Chapman, Douglas W.: *See—*
Caskey, Douglas C.; and Chapman, Douglas W., 4,571,437, Cl. 564-418.000.
Chapman, Richard E.; and Moyer, Gary V. Foldable saw horse. 4,570,752, Cl. 182-155.000.
Charles Stark Draper Laboratory, The: *See—*
Johnson, William M., 4,571,076, Cl. 356-152.000.
Chastine, Gary L., to General Electric Company. Hermetic compressor including a terminal block and thermal protection retainer means. 4,571,517, Cl. 310-68.00C.
Chateauneuf, Guy: *See—*
Chateauneuf, Robert; and Chateauneuf, Guy, 4,570,961, Cl. 280-47.180.
Chateauneuf, Robert; and Chateauneuf, Guy. Multi purpose transport cart. 4,570,961, Cl. 280-47.180.
Chatterjee, Shyam S.; Gabard, Bernard L.; and Jaggy, Hermann E. W., to Dr. Willmar Schwabe GmbH & Co. Pharmaceutical compositions containing bilobalid for the treatment of neuropathies. 4,571,407, Cl. 514-464.000.
Chauvier, Daniel J. V. D. Vacuum sleeve valve. 4,570,660, Cl. 137-114.000.
Chavez, Michael. Toothbrush container. 4,570,652, Cl. 132-84.00R.
Chavira, Salvador V. Retractable vehicle step assembly. 4,570,962, Cl. 280-166.000.
Chelette, K. Darrel: *See—*
Blose, Thomas L.; and Chelette, K. Darrel, 4,570,982, Cl. 285-334.000.
Chemische Werke Huls AG: *See—*
Gude, Fritz; and von Praun, Ferdinand, 4,571,426, Cl. 549-257.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Muller, Wolfgang H. E.; Boxkes, Werner; and Scholten, Heinz, 4,571,284, Cl. 203-14.000.
Chenard, Bertrand L., to Du Pont de Nemours, E. I., and Company. Substituted benzopentathiepins. 4,571,404, Cl. 514-431.000.
Cheng, Tsen-Chung: *See—*
Rodriguez-Pena, Alonso; Cheng, Tsen-Chung; and Wu, Chuck Y., 4,571,539, Cl. 324-72.000.
Chepurnoi, Nikolai P.: *See—*
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.
Chevreau, Jean-Philippe J.; and Guidoux, Loic B. Y., to Telecommunications Radioelectriques et Telephoniques T.R.T. Method and apparatus for reducing the convergence time of an echo canceller. 4,571,720, Cl. 370-32.000.
Chevron Research Company: *See—*
Offermann, Paul F., 4,571,487, Cl. 219-482.000.
Chiang, George C., to Du Pont de Nemours, E. I., and Company. Process for the preparation of o-carboethoxybenzenesulfonamide. 4,571,429, Cl. 560-12.000.
Chicago Bridge & Iron Company: *See—*
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,570,702, Cl. 165-159.000.
Chikaoka, Yasuji: *See—*
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.
Chlechowitz, Arno: *See—*
Weber, Rolf; Pollak, Gerd; and Chlechowitz, Arno, 4,570,813, Cl. 220-3.000.
Chow, Pei-Ming D., to Rockwell International Corporation. Mask alignment measurement structure for semiconductor fabrication. 4,571,538, Cl. 324-65.00R.
Christensen, Jorgen A.; and Everland, Peer, to A/S Ferrosan. Optical resolution of racemic femoxetine. 4,571,424, Cl. 546-236.000.
Christie, Bert M.: *See—*
Lindenberger, James N.; Christie, Bert M.; and Johnson, Roy V., 4,571,449, Cl. 174-35.0MS.
Christopher, T. Graham. Urinary catheter with collapsible urethral tube. 4,571,241, Cl. 604-104.000.
Chrysler Corporation: *See—*
Doran, Daniel W., 4,570,440, Cl. 60-322.000.
Chubu Electric Co., Mitsubishi Denki Kabushiki Kaisha & NGK Insulators, Inc.: *See—*
Mitsumatsu, Yoshio; Kamio, Akio; Seike, Shoji; and Nozaki, Masayuki, 4,571,660, Cl. 361-127.000.
Ciallella, Loretta K., to Colgate-Palmolive Company. Built nonionic detergent composition containing stabilized polyethylene terephthalate-polyoxyethylene terephthalate soil release promoting polymer. 4,571,303, Cl. 252-174.23G.
Ciba-Geigy Corporation: *See—*
Ray, Levon L.; and Longoria, Jose L., 4,570,380, Cl. 47-58.000.
Cii Honeywell Bull: *See—*
Barski, Guy, 4,571,648, Cl. 360-105.000.
Cincinnati Fiber Inc.: *See—*
Lohman, Donald J., 4,570,573, Cl. 119-1.000.
Cincinnati Milacron Inc.: *See—*
Peterson, David A., 4,570,505, Cl. 74-467.000.
Cirillo, John R. Temperature regulating, pressure relief flow valves employing shaped memory alloys. 4,570,851, Cl. 236-93.00R.
Clairol Incorporated: *See—*
Kunz, Raymond W.; and Pitcher, Gerald K., 4,570,616, Cl. 128-36.000.
Clark, Richard H., to Deere & Company. Adjustable width closing wheels for planter row units. 4,570,554, Cl. 111-85.000.
Clegg, John E. Ellipsograph. 4,570,344, Cl. 33-30.100.
Clinical Data Inc.: *See—*
Day, Christopher C., 4,571,547, Cl. 328-116.000.
Clouser, Leon C.: *See—*
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.
Clouser, Michael T., to Emhart Industries, Inc. Flue damper control system. 4,570,847, Cl. 236-1.00G.
CNEN-Comitato Nazionale per l'Energia Nucleare: *See—*
Gerontopoulos, Panaiotis; Cogliati, Guido; and Richter, Karl, 4,571,315, Cl. 264-0.500.
Code-A-Phone Corporation: *See—*
Shefler, Gerald E., 4,571,463, Cl. 179-90.00B.
Coflexip: *See—*
Genini, Maurice; and Szabo, Rene , 4,570,716, Cl. 166-346.000.
Cogan, Adrian I., to GTE Laboratories Incorporated. Method of producing isolated regions for an integrated circuit substrate. 4,570,330, Cl. 29-576.00W.
Cogliati, Guido: *See—*
Gerontopoulos, Panaiotis; Cogliati, Guido; and Richter, Karl, 4,571,315, Cl. 264-0.500.
Coin Acceptors, Inc.: *See—*
Holland, Charlie R.; and DelPercio, Michael J., 4,570,821, Cl. 221-194.000.

Colanzi, Franco; and Beton, Gordon, to RIV-SKF Officine di Villar Perosa S.p.A. Belt drive unit for transmitting drive between the drive shaft on an internal combustion engine and associated accessories. 4,571,227, Cl. 474-199.000.

Colby, Edward. Table with adjustable height mechanism. 4,570,547, Cl. 108-141.000.

Colgate-Palmolive Company: *See—*
Ciallella, Loretta K., 4,571,303, Cl. 252-174.230.
Silvis, Salvatore J., 4,571,299, Cl. 210-511.000.

Collings, Jerry M., to Hybrid Systems Corporation. Successive approximation analog-to-digital converter. 4,571,507, Cl. 307-350.000.

Collins, John M.: *See—*
Groth, Hugh F.; and Collins, John M., 4,570,856, Cl. 239-310.000.

Colodner, Jesse L.: *See—*
Irmscher, Edward; and Colodner, Jesse L., 4,571,250, Cl. 55-359.000.

Combustion Engineering, Inc.: *See—*
Ferguson, William B., Jr.; Bresowar, Gerald E.; and Wheeler, Louis B., 4,571,311, Cl. 261-64.00B.
Wilt, Morgan L., 4,570,550, Cl. 110-180.000.

Commissariat a l'Energie Atomique: *See—*
Allemand, Louis R.; Calvet, Jean; Cavan, Jean-Claude; Goldwasser, Maurice; and Thevenin, Jean-Claude, 4,571,313, Cl. 264-1.500.
Bonniaud, Roger; Jouan, Antoine; and Hery, Yves, 4,571,307, Cl. 252-628.000.
Costes, Didier, 4,571,323, Cl. 376-282.000.

Compagnucci, Rossano, to Ferriere Nord S.p.A.; and Silo S.p.A. Support for the winding of packages of wire. 4,570,871, Cl. 242-77.200.

Computerized Sports Equipment, Inc.: *See—*
Silverman, Gordon; and Brudny, Joseph, 4,571,682, Cl. 364-413.000.

Connelly, Keith. Firefly illusion. 4,570,924, Cl. 272-8.00P.

Conquest, Alexander R.; and Powling, Christopher F., to Standard Telephones and Cables plc. Leadless capacitors. 4,571,662, Cl. 361-306.000.

Consolati, Piero. Resilient spectacles hinge and method for making a spectacles frame bearing a resilient spectacles hinge. 4,570,289, Cl. 16-228.000.

Constantinian, Krikor, to Rexroth Sigma. Fluid distributors. 4,570,671, Cl. 137-596.000.

Continental White Cap, Inc.: *See—*
Lecinski, Frank H.; and Banich, John N., Sr., 4,570,811, Cl. 215-343.000.

Contran Conveyors & Systems, Inc.: *See—*
Thwaites, John A.; Miller, Hyman; and Ferrara, Ronald A., 4,570,780, Cl. 198-781.000.

Conway, Kay S. Case for curling iron or similar article. 4,570,792, Cl. 206-349.000.

Cook, Ernest E.: *See—*
Neidell, Norman S.; and Cook, Ernest E., 4,571,710, Cl. 367-38.000.

Cook, Stuart A.: *See—*
Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., 4,571,197, Cl. 446-6.000.
Mayer, John F.; Cook, Stuart A.; Springer, Harvey G.; and Wood, Earl M., Jr., 4,571,206, Cl. 446-330.000.

Cooper Industries, Inc.: *See—*
Hogoboom, David R., 4,570,791, Cl. 206-326.000.

Cooper LaserSonics, Inc.: *See—*
Fountain, William D., 4,571,030, Cl. 350-385.000.

Coops, Melvin S.: *See—*
Kane, Noel S.; Robbins, Jack L.; and Coops, Melvin S., 4,571,492, Cl. 250-303.000.

Copeland, James L.: *See—*
Larson, Spencer B.; Johnson, Richard H.; Hennemann, Thomas L., Jr.; and Copeland, James L., 4,571,327, Cl. 422-263.000.

Cordiano, Ettore, to Corint s.r.l. Power-assisted rack-and-pinion steering apparatus. 4,570,737, Cl. 180-148.000.

Cordis Corporation: *See—*
Slocum, Chester D.; and Batty, John R., Jr., 4,571,589, Cl. 340-870.320.

Coren, Alfred S. Locking joints. 4,571,113, Cl. 403-322.000.

Corint s.r.l.: *See—*
Cordiano, Ettore, 4,570,737, Cl. 180-148.000.

Corning Glass Works: *See—*
Parker, Edwin H.; and Piazza, Giacomo J., 4,571,350, Cl. 427-109.000.

Cosco Industries, Inc.: *See—*
Baum, Wendell E., 4,570,342, Cl. 30-162.000.

Cosden Technology, Inc.: *See—*
MacLaughlin, Donald; and Fortuna, Vincent E., 4,571,281, Cl. 156-580.000.

Costes, Didier, to Commissariat a l'Energie Atomique. Cooling device. 4,571,323, Cl. 376-282.000.

Cosyns, Jean; and Boitiaux, Jean-Paul, to Institut Francais du Petrole. Process for selectively hydrogenating acetylene in a mixture of acetylene and ethylene. 4,571,442, Cl. 585-261.000.

Cote, George R. Hockey stick having wedge insert in the blade. 4,570,932, Cl. 273-67.00A.

Coulter Electronics of New England, Inc.: *See—*
Ford, Norman C., Jr., 4,571,081, Cl. 356-349.000.

Courteheuse, Gerard: *See—*
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,571,326, Cl. 422-207.000.

Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,570,394, Cl. 52-72.000.

Cover, John H. Energy conversion system with fermentation. 4,571,534, Cl. 322-2.00R.

Covington, Roger G.: *See—*
Cahill, Steven P.; and Covington, Roger G., 4,571,718, Cl. 369-291.000.

Cox, Gordon C.; and Shorrock, Peter, to Leslie Hartridge Limited. Press. 4,570,839, Cl. 227-1.000.

Coyle, Chandler K.: *See—*
Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., 4,571,090, Cl. 366-270.000.

Cozzoli Machine Co.: *See—*
Procacino, Robert A., 4,570,822, Cl. 222-14.000.

CPG Products Corp.: *See—*
Mayer, John F.; Cook, Stuart A.; Springer, Harvey G.; and Wood, Earl M., Jr., 4,571,206, Cl. 446-330.000.

Crabtree, Michael R.: *See—*
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.

Crass, Otto G. Method and apparatus for measurement of valve stem thrust. 4,570,903, Cl. 251-129.120.

Craven, Charles G. Motor driven golf bag cart. 4,570,732, Cl. 180-19.300.

Creative Products Resource Associates, Ltd.: *See—*
Murphy, Betty J., 4,570,820, Cl. 221-34.000.

Crepinsek, Alois. Engagement of lock body within a hollow door-stile. 4,570,471, Cl. 70-451.000.

Creske, Edward J. Adjustable pedestal. 4,570,397, Cl. 52-126.600.

Criqui, William D.; and Smith, Larry L. Bicycle beverage holder. 4,570,835, Cl. 224-36.000.

Cristobal, Carlos C.: *See—*
Palacio, Joaquin J.; and Cristobal, Carlos C., 4,570,407, Cl. 52-693.000.

Crosby, Robert J., to Acme-Cleveland Corporation. Electronic control circuit. 4,571,501, Cl. 307-252.00R.

Cryo, Corporation: *See—*
Perkins, Warren E.; and Novak, Mark T., 4,570,819, Cl. 220-374.000.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Pirani, Giancarlo; and Zingarelli, Valerio, 4,571,732, Cl. 375-12.000.

Cseve, Ferenc: *See—*
Szemere, Robert; Majoros, Jozsef; and Cseve, Ferenc, 4,570,838, Cl. 225-93.000.

Csorsz, Alex E. Multiphase AC-DC resonant cascade power converter. 4,571,667, Cl. 363-51.000.

Cubic Corporation: *See—*
Justice, Raymond, 4,571,592, Cl. 343-767.000.

Culbertson, E. C.; and Farrar, Grover L., to American Hoechst Corporation. Polyester film primed with crosslinked acrylic polymers. 4,571,363, Cl. 428-332.000.

Culbertson, Townley P.: *See—*
Hutt, Marland P.; Mich, Thomas F.; and Culbertson, Townley P., 4,571,396, Cl. 514-249.000.

Cullison, Jesse L. Apparatus and method for forming wall base coved trim strip material. 4,570,350, Cl. 33-562.000.

Cumberland Packing Corp.: *See—*
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,571,345, Cl. 426-548.000.

Cunningham, Charles J.: *See—*
Brown, Russell L.; Bryant, George M.; and Cunningham, Charles J., 4,571,360, Cl. 428-318.400.

Curtis, Joel E., to Southwestern Products, Inc. Recessed flexible wall refuse container. 4,570,812, Cl. 220-1.00T.

Cusano, Dominic A.: *See—*
Greskovich, Charles D.; Cusano, Dominic A.; and DeBianca, Frank A., 4,571,312, Cl. 264-1.200.

Cutler, Terry W.: *See—*
Quante, M. John; and Cutler, Terry W., 4,570,391, Cl. 52-39.000.

CWS AG: *See—*
Arabian, Sandro; Baumann, Manfred; and Besserer, Walter, 4,570,823, Cl. 222-26.000.

Czech, John F.; Drucker, Irving M.; and Inaba, Akinobu, to Zenith Electronics Corporation. Tiltable rotating display monitor mount. 4,570,892, Cl. 248-372.100.

D. C. Research, Inc.: *See—*
Penterman, Francis M., 4,571,156, Cl. 416-132.00B.

Dahan, Jose , to Rodam SA. Orthodontic jack for maxillary expansion appliance. 4,571,177, Cl. 433-7.000.

Daig Corporation: *See—*
Kane, Lawrence M.; and Revane, James E., 4,570,642, Cl. 128-785.000.

Daimler-Benz Aktiengesellschaft: *See—*
Gmeiner, Gunter; Hugger, William; and Binder, Rudolf, 4,570,989, Cl. 296-97.00J.
Schmied, Kurt, 4,570,853, Cl. 239-116.000.

Dalimonte, Alfred A.; and Fung, Paul J., to Microband Corporation of America. Television transmitter. 4,571,621, Cl. 358-186.000.

Dambach, Philip J.: *See—*
Bassler, Max; and Dambach, Philip J., 4,571,012, Cl. 339-14.00R.

Damewood, Glenn: *See—*
Sparks, Cecil R.; and Damewood, Glenn, 4,570,745, Cl. 181-228.000.

Daniel Corporation: *See*—
Breden, Charles R.; and Danielczyk, Zygmunt, 4,571,219, Cl. 474-70.000.

Danielczyk, Zygmunt: *See*—
Breden, Charles R.; and Danielczyk, Zygmunt, 4,571,219, Cl. 474-70.000.

Daniels, Edward N. Vehicle security apparatus. 4,570,778, Cl. 194-239.000.

Dannemiller, Timothy J., to Cardinal Industries, Inc. Foundations anchor for a modular building. 4,570,403, Cl. 52-295.000.

Darinsky, Nikolai V.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Das, Subrata K.; Dixon, Norman R.; and Gluck, Robert F., to International Business Machines Corporation. Wind/breath screen for a microphone. 4,570,746, Cl. 181-242.000.

Data I/O Corporation: *See*—
Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., 4,571,724, Cl. 371-25.000.

Datacopy Corporation: *See*—
Schneider, Eric C.; Hebard, Elaine; and Rumley, Stuart D., 4,571,638, Cl. 358-293.000.

Date, Takao, to Toshiba Kikai Kabushiki Kaisha. Device for clamping boring bar in horizontal boring and milling machine. 4,571,131, Cl. 409-209.000.

Davidov, Mircho A.; and Tentler, Michael L., to Oak Industries Inc. Hybrid frequency modulation feedback loop remote volume control circuit. 4,571,622, Cl. 358-194.100.

Davio, Franklin J.: *See*—
Szanto, Elmer G.; Davio, Franklin J.; and Wallace, Lloyd V., 4,570,351, Cl. 33-180.00R.

Davis, Garland H., to Santa Fe Pipeline Company. Densitometer proving system. 4,570,476, Cl. 73-1.00R.

Davis, Harold L., to Mostek Corporation. CMOS ROM Data select circuit. 4,571,708, Cl. 365-203.000.

Day, Christopher C., to Clinical Data Inc. Adaptive signal detection system especially for physiological signals such as the R waves of ECG signals, which is desensitized to artifacts. 4,571,547, Cl. 328-116.000.

Dayco Corporation: *See*—
Long, Delmar D., 4,570,566, Cl. 118-34.000.
Woodland, Carl R., 4,571,230, Cl. 474-264.000.

De La Rue Systems Limited: *See*—
Martin, Harvey G.; and Bruin, Nicholas A., 4,570,548, Cl. 109-66.000.

Dean, Charles F.; Lauer, Edward W.; and Riggs, David L., to United States of America, Navy. Pyrotechnic-actuated dual air valve. 4,570,658, Cl. 137-68.200.

DeArras, James M., to Hand-Held Products, Inc. Powerless remote program reservoir. 4,571,702, Cl. 364-900.000.

DeBianca, Frank A.: *See*—
Greskovich, Charles D.; Cusano, Dominic A.; and DeBianca, Frank A., 4,571,312, Cl. 264-1.200.

Debrabander, Armand, to Vibrachoc. Indicator light for printed circuits. 4,571,016, Cl. 339-17.00D.

De Cock, Etienne M.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; Van Peteghem, Willy F.; and De Cock, Etienne M., 4,571,602, Cl. 346-160.000.

Deere & Company: *See*—
Clark, Richard H., 4,570,554, Cl. 111-85.000.
Herr, Friedhelm, 4,570,417, Cl. 53-428.000.
Nighswonger, Lester L., 4,570,509, Cl. 74-710.500.

De Forrest, William. Apparatus and process related to keying a lock with a control key. 4,570,355, Cl. 33-539.000.

de Groot, Jacobus H., to B.V. Korthofah. Printing apparatus with article driven text roll. 4,570,537, Cl. 101-35.000.

Degussa Aktiengesellschaft: *See*—
Konig, Karl-Heinz; Schuster, Michael; Hollmann, Dieter; and Schlodder, Rainer, 4,571,265, Cl. 75-108.000.
Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, 4,571,266, Cl. 75-108.000.

Delavan Corporation: *See*—
Bintner, Dennis W.; Ryan, Joseph B., Jr.; and Bartel, Mark H., 4,570,858, Cl. 239-390.000.

Delbou, Tor: *See*—
Olenfalk, Lars; and Delbou, Tor, 4,570,983, Cl. 285-355.000.

DeLong, Russell. Tree ball wrapping device. 4,570,423, Cl. 53-578.000.

DelPercio, Michael J.: *See*—
Holland, Charlie R.; and DelPercio, Michael J., 4,570,821, Cl. 221-194.000.

Del Rosso, Victor, to Hi-Speed Checkweigher Co., Inc. High speed transporting and weighing machine with dynamic balance. 4,570,729, Cl. 177-145.000.

Demeyer, Pierre; and Duval, Philippe, to Gerin, Merlin. Static overcurrent trip device to operate a circuit breaker in response of fault conditions in an alternating current net system. 4,571,659, Cl. 361-95.000.

de Moncuit, Frederic: *See*—
Taupin, Pierre; Goguillon, Claude; and de Moncuit, Frederic, 4,571,577, Cl. 340-347.00R.

de Montalembert, Bernard. Device for retaining an article on an item of clothing. 4,570,302, Cl. 24-3.00H.

Dence, William R. Adapter for mounting an exhaust muffler to an internal combustion engine and method for installing same. 4,570,322, Cl. 29-402.170.

Denney, Richard M.: *See*—
Abell, Creed W.; and Denney, Richard M., 4,571,381, Cl. 435-7.000.

dePina, Russell M.: *See*—
Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., 4,571,724, Cl. 371-25.000.

Derbidge, T. Craig; Mulholland, James A.; and Foster, Edward P., to International Coal Refining Company. Firing of pulverized solvent refined coal. 4,570,551, Cl. 110-263.000.

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de Vries, Jan; and de Ruiter, Jacob W., 4,571,522, Cl. 313-485.000.

De Schamphelaere, Lucien A.; Librecht, Freddy M.; Van Peteghem, Willy F.; and De Cock, Etienne M., to AGFA-Gevaert, N.V. Recording apparatus. 4,571,602, Cl. 346-160.000.

Desmas, Thierry: *See*—
Baumaire, Alain; Desmas, Thierry; and Vambenepe, Guy, 4,570,489, Cl. 73-658.000.

Deutsch, Leslie J.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,570,520, Cl. 84-1.010.

Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instruments Mfg. Co., Ltd. Tone generator assignment in a keyboard electronic musical instrument. 4,570,520, Cl. 84-1.010.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Peschka, Walter; Schneider, Gottfried; and Nieratschker, Willi, 4,570,578, Cl. 123-1.00A.

Deutschmann, Herbert; Haussmann, Gerhard; and Kamleitner, Ewald, to MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH. Reciprocating piston internal combustion engine. 4,570,442, Cl. 60-612.000.

Devine, George T., to Gilbarco Inc. Apparatus for preventing blockage of vapor recovery hose by liquid fuel. 4,570,686, Cl. 141-286.000.

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Dey, Ranjit. Storage battery charging and monitoring apparatus. 4,571,533, Cl. 320-25.000.

DiCicca, Franscesco; Fahmy, Farid M.; and Triolo, Ferdinand, to General Foods Corporation. Charcoal broiled flavor composition. 4,571,342, Cl. 426-533.000.

Dicore Resources, Ltd.: *See*—
Singfield, Peter, 4,571,484, Cl. 219-271.000.

DiCosimo, Robert; Burrington, James D.; and Grasselli, Robert K., to Standard Oil Company, The. Process for effecting oxidative dehydrodimerization. 4,571,443, Cl. 585-428.000.

Diebold, Camille, to Joustra S.A. Electrically powered modular toy set. 4,571,202, Cl. 446-90.000.

Diedrich, Klaus; and Weis, Helmar, to Wilhelm Staub GmbH, Firma. Apparatus for the exposure of photosensitive plates on two sides. 4,571,073, Cl. 355-89.000.

Diehl GmbH & Co.: *See*—
Bock, Erich; Hammer, Helmut; and Postler, Gunther, 4,570,541, Cl. 102-216.000.

Diehl, Philip A. Folding carton with prefitted interior wrapping. 4,571,232, Cl. 493-96.000.

Diehl, Robert J.; Hollister, F. Harold; and Meyer, Danny S., to Joy Manufacturing Company. Dual diameter valve stem packing. 4,570,942, Cl. 277-12.000.

Diesel Kiki Co., Ltd.: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,571,164, Cl. 418-76.000.

Dietz, Hans, to Wurster u. Dietz GmbH u. Co. Maschinenfabrik. Method and apparatus for producing lumber products which are machined on all sides. 4,570,687, Cl. 144-378.000.

DiFazio, Joseph, to Acorn Building Components, Inc. Screen frame corner connector key. 4,570,406, Cl. 52-656.000.

Dildine, Gerald R. Method of removing sediment from a large storage container. 4,571,271, Cl. 134-21.000.

Dills, Raymond L.: *See*—
Smith, Peter H.; and Dills, Raymond L., 4,571,581, Cl. 340-600.000.

Dischert, Robert A.; Meise, William H.; and Berard, Clement A., Jr., to RCA Corporation. Noise reduction system. 4,571,511, Cl. 307-547.000.

Discovision Associates: *See*—
Szerlip, Stanley R., 4,571,716, Cl. 369-54.000.

Disko, Harry: *See*—
Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., 4,571,197, Cl. 446-6.000.

Distler, Walter; and Peter, Fritz, to Siemens Aktiengesellschaft. Measurement system unit for a computer tomograph. 4,571,495, Cl. 250-394.000.

Dittner, Adam; and Sauer, Joachim, to FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien. Anti-slipping system. 4,571,010, Cl. 303-110.000.

Dixie Canada Inc.: *See*—
Hall, Charles J., 4,570,845, Cl. 229-33.000.

Dixon, A. John: *See—*
Manning, Peter R.; and Dixon, A. John, 4,571,209, Cl. 446-375.000.
Dixon, Norman R.: *See—*
Das, Subrata K.; Dixon, Norman R.; and Gluck, Robert F., 4,570,746, Cl. 181-242.000.
Dobrovolny, Pierre, to Zenith Electronics Corporation. Switched bandpass filter. 4,571,560, Cl. 333-174.000.
Dr. Johannes Heidenhain GmbH: *See—*
Burkhardt, Horst, 4,570,346, Cl. 33-125.00R.
Miller, Walter, 4,570,347, Cl. 33-125.00R.
Dr. Willmar Schwabe GmbH & Co.: *See—*
Chatterjee, Shyam S.; Gabard, Bernard L.; and Jaggy, Hermann E. W., 4,571,407, Cl. 514-464.000.
Dodd, Robert N. Electrically actuated can crusher. 4,570,536, Cl. 100-53.000.
Dodson, Daniel P.; and Ludwig, George C., to AVM, Inc. Pneumatic spring counterbalance having improved damping structure. 4,570,912, Cl. 267-64.150.
Doherty, John P.: *See—*
Bourbeau, Arthur J., Jr.; and Doherty, John P., 4,571,072, Cl. 355-79.000.
Dolan, John P.: *See—*
Stieg, Richard F.; Dolan, John P.; Worley, Wm. Spencer; and Gerbert, Goran, 4,571,216, Cl. 474-8.000.
Dolden, John G.; Fogg, Sidney G.; and Lidy, Werner A., to British Petroleum Company p.l.c., The. Phenolic resin composition. 4,571,413, Cl. 524-199.000.
Dolivo, Francois B.; Ungerboeck, Gottfried; and Howell, Thomas D., to International Business Machines Corporation. Method and apparatus for decoding the output signal of a partial-response class-IV communication or recording-device channel. 4,571,734, Cl. 375-18.000.
Dolomite, S.p.A.: *See—*
Annovi, Giuseppe, 4,570,363, Cl. 36-117.000.
Dombrowski, Adrian T.: *See—*
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.
Donelin, Dwayne D.: *See—*
Valentino, Pasquale A.; Stangel, John J.; and Donelin, Dwayne D., 4,571,591, Cl. 343-754.000.
Doran, Daniel W., to Chrysler Corporation. Articulated connector. 4,570,440, Cl. 60-322.000.
Dornier GmbH: *See—*
Gehse, Hartmut, 4,570,880, Cl. 244-122.0AF.
Dornier System GmbH: *See—*
Wess, Othmar, 4,570,634, Cl. 128-328.000.
Dove, Arthur. Safety vest. 4,570,974, Cl. 280-801.000.
Dow Industries: *See—*
Lindenberger, James N.; Christie, Bert M.; and Johnson, Roy V., 4,571,449, Cl. 174-35.0MS.
Downs, Michael J. Apparatus and method for measuring refractive index. 4,571,082, Cl. 356-351.000.
Dozsa, Laszlo : *See—*
Ferenczi, Gyorgy; Boda, Janos; Toth, Ferenc; Horvath, Peter; Benkovics, Laszlo ; and Dozsa, Laszlo , 4,571,541, Cl. 324-158.00D.
Drago, Thomas E.: *See—*
Ripka, Chester D.; Friedman, James N.; and Drago, Thomas E., 4,570,612, Cl. 126-360.00A.
Drakaliiski, Boris Y.: *See—*
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.
Drake, Charles A., to Phillips Petroleum Company. Process for the production of allyl acetate. 4,571,431, Cl. 560-243.000.
Draper Corporation: *See—*
Feigl, Rudolf F., 4,570,684, Cl. 139-449.000.
Draper, David L., to Cars & Concepts, Inc. Conversion of vehicle bodies. 4,570,321, Cl. 29-401.100.
Drawert, Manfred; and Krase, Horst, to Schering AG. Alcohol-soluble polyamides and printing inks. 4,571,267, Cl. 106-27.000.
Drazan, Pavel J., to National Research Development Corporation. Manipulating unit. 4,571,148, Cl. 414-730.000.
Drower, Herbert M., to Sealtran Corporation. Line retractor. 4,570,866, Cl. 242-47.500.
Drucker, Irving M.: *See—*
Czech, John F.; Drucker, Irving M.; and Inaba, Akinobu, 4,570,892, Cl. 248-372.100.
Drusch et Cie: *See—*
Grangereau, Jean A. M., 4,571,568, Cl. 335-299.000.
Dudouyt, Jean-Paul. Light sailing vehicle with movably mounted mast. 4,570,562, Cl. 114-39.000.
Dudro, Harry R., Jr.; and Morris, Frank E., to BMI, Inc. Method of constructing refractory runner. 4,571,318, Cl. 264-30.000.
Duffy, Edward K., to Essex Group, Inc. Moisture impervious power cable and conduit system. 4,571,450, Cl. 174-68.00C.
Duffy, James J., to Ford Motor Company. Dual rotary valve for variable assist power steering gear for automotive vehicles. 4,570,735, Cl. 180-142.000.
Dunlop Limited: *See—*
Moore, Alan F., 4,570,979, Cl. 285-223.000.
Dunn, Patrick F.; Herceg, Joseph E.; and K[illegible]sieben, Robert H., to United States of America, Energy. App[illegible]tus for sampling and characterizing aerosols. 4,570,494, Cl. 73-86[illegible].220.
Dupin, Gerard, to Avions Marcel Dassault-Breguet. Pyrotechnical process and device for bailing out of an aircraft. 4,570,879, Cl. 244-122.0AF.
Du Pont de Nemours, E. I., and Company: *See—*
Chenard, Bertrand L., 4,571,404, Cl. 514-431.000.
Chiang, George C., 4,571,429, Cl. 560-12.000.
Mammone, Joseph F., 4,571,411, Cl. 523-457.000.
Potter, Raymond G., 4,571,238, Cl. 494-12.000.
Reeves, Anthony V., 4,571,488, Cl. 219-544.000.
Durkan, Gerald, to Kircaldie, Randall and McNab (As Trustee). Respirating gas supply method and apparatus therefor. 4,570,631, Cl. 128-204.230.
Durkoppwerke GmbH: *See—*
Reinke, Kurt; Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, 4,570,555, Cl. 112-67.000.
Duropal-Werk Ebehr. Wrede GmbH & Co. KG: *See—*
Tuneke, Wilhelm; and Weber, Jurgen, 4,570,410, Cl. 52-811.000.
Durr, Helmut, to Braun Aktiengesellschaft. Swing bridge. 4,570,499, Cl. 74-44.000.
Dushenko, Michael D.; Castner, Harvey R.; Baugh, Robert T.; and Shupert, Paul T., to Allis-Chalmers Corporation. Tote pan and warehouse rack structure therefor. 4,570,806, Cl. 211-191.000.
Dutt, William H., to Albany International Corp. Papermakers wet-press felt and method of manufacture. 4,571,359, Cl. 428-240.000.
Duval, Philippe: *See—*
Demeyer, Pierre; and Duval, Philippe, 4,571,659, Cl. 361-95.000.
Dyer, Gloria. Apparatus for converting a car seat to a stroller. 4,570,956, Cl. 280-30.000.
Dyett, Derek H.: *See—*
Ahern, Ronald A.; Dyett, Derek H.; Labbe, Francis A. M.; and Wood, Godfrey A., 4,570,644, Cl. 131-109.00R.
Dynamit Nobel AG: *See—*
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,571,427, Cl. 556-476.000.
Dynatech Computer Power, Inc.: *See—*
Ruckman, Stephen E., 4,571,656, Cl. 361-56.000.
Eakin, Bertram E.: *See—*
Friedman, Robert H.; and Eakin, Bertram E., 4,571,294, Cl. 208-11.0LE.
Eastman Kodak Company: *See—*
Bothner, Carl R., 4,571,071, Cl. 355-15.000.
Cahill, Steven P.; and Covington, Roger G., 4,571,718, Cl. 369-291.000.
Henry, James W.; and Mumpower, Robert C., 4,571,497, Cl. 250-560.000.
Robinson, Kelly S.; Weitzel, Richard A.; and Kroll, Arthur S., 4,570,572, Cl. 118-657.000.
Eaton Corporation: *See—*
Benjamin, James A.; Lade, Robert W.; Schutten, Herman P.; and Jaskolski, Stanley V., 4,571,606, Cl. 357-23.400.
Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., 4,571,513, Cl. 307-577.000.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,571,512, Cl. 307-577.000.
Sokalski, Robert G., 4,570,484, Cl. 73-301.000.
Eaton, S. Sheffield, Jr.; and Hu, Cheng-Cheng, to Inmos Corporation. Thick oxide field-shield CMOS process. 4,570,331, Cl. 29-576.00B.
Eaton, Sargent S., Jr., to Inmos Corporation. Method and apparatus of reducing latch-up susceptibility in CMOS integrated circuits. 4,571,505, Cl. 307-297.000.
Ebauches, S.A.: *See—*
Schneiter, Ali, 4,571,516, Cl. 310-49.00R.
Eberhardt, H. Alfred, to Hale Fire Pump Company. Fuel supply for a piston engine. 4,570,605, Cl. 123-576.000.
Ebner-Industrieofenbau Ing. Josef Ebner KG: *See—*
Ebner, Peter, 4,571,273, Cl. 148-16.000.
Ebner, Peter, to Ebner-Industrieofenbau Ing. Josef Ebner KG. Process of heating and cooling charges in batch-process industrial furnaces. 4,571,273, Cl. 148-16.000.
Eckel, Alan, to Eckel Industries, Inc. Door mount and door nose. 4,570,384, Cl. 49-501.000.
Eckel Industries, Inc.: *See—*
Eckel, Alan, 4,570,384, Cl. 49-501.000.
Economics Laboratory, Inc.: *See—*
Larson, Spencer B.; Johnson, Richard H.; Hennemann, Thomas L., Jr.; and Copeland, James L., 4,571,327, Cl. 422-263.000.
Economy Label Sales, Inc.: *See—*
Stover, Gary L., 4,570,368, Cl. 40-10.00C.
Edens, Glenn T.: *See—*
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.
Edouard Dubied & Cie. S.A.: *See—*
Otto, Gunter, 4,570,463, Cl. 66-221.000.
Edwardson, Svante R., to AB Dentatus. Implement for abrasion. 4,571,184, Cl. 433-166.000.
Egami, Tsuneyuki; Kawai, Hisasi; and Saito, Tsutomu, to Nippon Soken, Inc. Method for controlling internal combustion engine. 4,570,594, Cl. 123-414.000.
Egawa, Akira: *See—*
Mizoguchi, Hakaru; Egawa, Akira; and Okamoto, Akira, 4,571,730, Cl. 372-58.000.
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, to General Electric Company. Method for providing insulated holes in conducting substrate. 4,571,322, Cl. 264-154.000.

Eickmann, Karl. Propeller with an interior arrangement to variate the pitch. 4,571,157, Cl. 416-158.000.
Eigelshofen, Gunter: *See—*
Bemm, Wulf; Bruckner, Rolf; and Eigelshofen, Gunter, 4,570,468, Cl. 70-252.000.
Eisai Co., Ltd.: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.
Eisler, David, to Xerox Corporation. Feeder and bottom stacker. 4,570,918, Cl. 271-3.100.
Elliott, Roderick D.; and Gardiner, Phillip J., to Miles Laboratories, Inc. Medicament inhalation device. 4,570,630, Cl. 128-203.150.
Ellis, Freddie T. Ova collecting apparatus and method. 4,570,299, Cl. 17-45.000.
Ellison, Arthur E.; and Borzone, Rocco R., to Pfizer Hospital Products Group Inc. Arched bridge staple. 4,570,623, Cl. 128-92.00B.
Elrod, Samuel D., to Boeing Company, The. Fiber reinforced resin composites formed of basic ply blankets. 4,571,355, Cl. 428-102.000.
Elton, David J.; and Harr, Milton E., to Purdue Research Foundation. Non-contact road profilometer and deflection meter. 4,571,695, Cl. 364-550.000.
EMA Instrument AB: *See—*
Jonsson, Nils I.; and Hedenstierna, Lars E., 4,570,664, Cl. 137-202.000.
Emhart Industries, Inc.: *See—*
Clouser, Michael T., 4,570,847, Cl. 236-1.00G.
Emry, Carl A., Jr.; Neuman, Grover H.; Mersiovsky, Lynda K.; and Pfeuffer, Margaret S., to International Business Machines Corporation. Page indexing system for accessing sequentially stored data representing a multi-page document. 4,571,700, Cl. 364-900.000.
Endorphin, Inc.: *See—*
Houck, John C.; and Patt, Leonard M., 4,571,336, Cl. 424-95.000.
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, to Shin-Etsu Chemical Co., Ltd. Ultrafine powder of silicon carbide, a method for the preparation thereof and a sintered body therefrom. 4,571,331, Cl. 423-345.000.
ENERTEC: *See—*
Merle, Jean-Pierre, 4,571,655, Cl. 360-132.000.
Engstrom, George L.: *See—*
Waldo, Russell W.; Miller, Cardell E.; Huot, Louis D.; and Engstrom, George L., 4,570,985, Cl. 292-262.000.
Enk, Allan T.: *See—*
Revells, Robert G.; and Enk, Allan T., 4,571,253, Cl. 65-273.000.
Enomoto, Masayasu: *See—*
Takayama, Masaharu; Taniguchi, Seiichi; Enomoto, Masayasu; and Muramoto, Masahiro, 4,571,383, Cl. 435-25.000.
Ensmenger, Gary. Toe-articulated stilt. 4,570,926, Cl. 272-70.100.
Epishina, Lia V.: *See—*
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Epson Corporation: *See—*
Ono, Toshiaki; and Kusabuka, Yoshito, 4,571,102, Cl. 400-248.000.
Erickson Tool Company: *See—*
Strand, Kevin O., 4,571,129, Cl. 408-54.000.
Eriksson, Ingemar. Digging apparatus applicable to a bucket loader. 4,571,146, Cl. 414-687.000.
Erlebach, Gustav; Holze, Roland; and Koch, Gerhard, to Hafele KG. Corner joint link for plates, particularly furniture boards. 4,571,115, Cl. 403-402.000.
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Antifriction-bearing throwout, particularly for automotive clutches. 4,570,773, Cl. 192-98.000.
Erwin Sick GmbH Optik-Elektronik: *See—*
Walter, Arthur, 4,571,582, Cl. 340-677.000.
Escher Wyss Aktiengesellschaft: *See—*
Holik, Herbert; Hund, Helmut; and Mirsberger, Peter, 4,570,314, Cl. 29-113.00R.
Eshet Eilon: *See—*
Raz, Omri, 4,570,420, Cl. 53-485.000.
Esmay, Edward N., to Bausch & Lomb Incorporated. Fiber optic microscope with adjustable tube assembly. 4,571,037, Cl. 350-507.000.
ESPE Fabrik pharmazeutischer Praeparate GmbH: *See—*
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,571,665, Cl. 362-225.000.
Essex Chemical Corp.: *See—*
Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., 4,570,827, Cl. 222-95.000.
Essex Group, Inc.: *See—*
Duffy, Edward K., 4,571,450, Cl. 174-68.00C.
Etani, Tadao: *See—*
Muto, Yoshiyuki; and Etani, Tadao, 4,571,011, Cl. 308-3.500.
Ethicon, Inc.: *See—*
Golden, Donald M., 4,570,633, Cl. 128-325.000.
Evans, Charles V.: *See—*
Sigmon, Bernard E.; and Evans, Charles V., 4,571,555, Cl. 331-56.000.
Evans, John L.; and Russell, Larry R., to Exxon Production Research Co. Magnetic single shot inclinometer. 4,570,353, Cl. 33-313.000.
Evans, John M.; and Cassidy, Frederick, to Beecham Group p.l.c. Anti-hypertensive chromans and chromenes. 4,571,406, Cl. 514-456.000.
Evans, Mervyn: *See—*
Harris, John D.; and Evans, Mervyn, 4,570,625, Cl. 128-92.00G.
Evans, Warren E. Fastener for holding an object to the side of a dryer. 4,570,888, Cl. 248-205.100.
Everland, Peer: *See—*
Christensen, Jorgen A.; and Everland, Peer, 4,571,424, Cl. 546-236.000.
Evode Limited: *See—*
Ward, David J., 4,570,834, Cl. 222-566.000.
Ewers, Ronald L.; and Barton, Bruce C., to Federal Motors, Inc. Fire truck torque box aerial frame. 4,570,973, Cl. 280-800.000.
Exxon Production Research Co.: *See—*
Evans, John L.; and Russell, Larry R., 4,570,353, Cl. 33-313.000.
Exxon Research and Engineering Co.: *See—*
Black, Laura E.; and Boucher, Heather A., 4,571,444, Cl. 585-819.000.
Eyler, Ronald. Releasable upholstery tie. 4,570,306, Cl. 24-90.00B.
F. F. Seeley Nominees Pty. Ltd.: *See—*
Seeley, Frederic F., 4,570,814, Cl. 220-4.00F.
FAG Kugelfischer Georg Schafer, Kommanditgesellschaft auf Aktien: *See—*
Dittner, Adam; and Sauer, Joachim, 4,571,010, Cl. 303-110.000.
Fahmy, Farid M.: *See—*
DiCicca, Franscesco; Fahmy, Farid M.; and Triolo, Ferdinand, 4,571,342, Cl. 426-533.000.
Fair, Jack E., to Caterpillar Tractor Co. Shroud for thermally sprayed workpiece. 4,570,568, Cl. 118-69.000.
Falk, Richard A. Molten metal sampler with tellurium additive. 4,570,496, Cl. 73-864.580.
Falk-Verlag fur Landkarten und Stadtplane Gerhard Falk GmbH: *See—*
Vogtlander, Alfred, 4,571,237, Cl. 493-416.000.
Falls, Andrew H.; Lawson, Jimmie B.; and Hirasaki, George J., to Shell Oil Company. Process for optimizing the noncondensible gas content of an oil-displacing steam-foam-forming mixture. 4,570,711, Cl. 166-272.000.
Fanuc Limited: *See—*
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,571,694, Cl. 364-513.000.
Fanuc Ltd: *See—*
Kishi, Hajimu; and Tanaka, Kunio, 4,571,670, Cl. 364-171.000.
Farajun, David. Apparatus for silo clean out. 4,571,138, Cl. 414-323.000.
Farrar, Grover L.: *See—*
Culbertson, E. C.; and Farrar, Grover L., 4,571,363, Cl. 428-332.000.
Fathi, Saul S., to Traveltec International, Inc. Portable steamer. 4,571,483, Cl. 219-271.000.
Fats and Proteins Research Foundation, Inc.: *See—*
Wendt, Charles W.; Shroder, Joseph D.; and Gerst, Michael D., 4,570,378, Cl. 47-9.000.
Fattori, Lazzaro A., to Rel Corporation, The. Dispenser closure. 4,570,826, Cl. 222-83.000.
Fatum, John H.: *See—*
Fey, Maurice G.; Fatum, John H.; and Meyer, Thomas N., 4,571,259, Cl. 75-10.00R.
Favre, Charles-Andres: *See—*
Winteler, Hans R.; and Favre, Charles-Andres, 4,571,580, Cl. 340-594.000.
Federal Express Corporation: *See—*
Shoenfeld, David B., 4,570,416, Cl. 53-415.000.
Federal Motors, Inc.: *See—*
Ewers, Ronald L.; and Barton, Bruce C., 4,570,973, Cl. 280-800.000.
Feese, Wolfgang: *See—*
Vogelsberg, Dieter; and Feese, Wolfgang, 4,570,432, Cl. 57-293.000.
Feigl, Rudolf F., to Draper Corporation. Tape restraining shoe for shuttleless looms. 4,570,684, Cl. 139-449.000.
Felzer, Theodore: *See—*
McPeak, Ercel W.; Felzer, Theodore; and Rodgers, Frederick J., 4,570,953, Cl. 280-5.300.
Fenoglio, John C.; Wilbur, David L.; and Anthony, William H., to Atlantic Richfield Company. Aluminum and zinc sacrificial alloy. 4,571,368, Cl. 428-654.000.
Fenwick, Danny L.; and Stanforth, Charles M., to General Electric Company. Pneumatic signal multiplexer. 4,570,675, Cl. 137-805.000.
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Ferguson, William B., Jr.; Bresowar, Gerald E.; and Wheeler, Louis B., to Combustion Engineering, Inc. Apparatus for introducing a process gas into a treatment chamber. 4,571,311, Cl. 261-64.00B.
Fernandez Sanz, Ignacio. Support for jars. 4,570,795, Cl. 206-430.000.
Ferrante, Joseph G.; Victoria, Henry J.; and Mileos, George, to General Foods Corporation. Method of baking pre-proofed frozen dough in an ovenable self-opening container. 4,571,340, Cl. 426-393.000.
Ferranti plc: *See—*
McPherson, Hugh, 4,571,663, Cl. 361-393.000.

Ferrara, Ronald A.: *See*—
Thwaites, John A.; Miller, Hyman; and Ferrara, Ronald A., 4,570,780, Cl. 198-781.000.

Ferret Bofill, Joaquim; and Para Joan, Josep, to Bendiberica S.A. Disc brake with caliper having releasably lockable reinforcements. 4,570,759, Cl. 188-73.320.

Ferriere Nord S.p.A.: *See*—
Compagnucci, Rossano, 4,570,871, Cl. 242-77.200.

Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game having pieces with pivotal arm. 4,570,938, Cl. 273-243.000.

Ferris, Ray L.; and Yates, Donald B., to Pullman Standard, Inc. Hatch cover and locking structure. 4,570,816, Cl. 220-314.000.

Feuerstein, Israel: *See*—
Labock, Yoram; Feuerstein, Israel; and Geiger, Avi, 4,571,455, Cl. 179-2.00A.

Fey, Maurice G.; Fatum, John H.; and Meyer, Thomas N., to Westinghouse Electric Corp. Apparatus and process for reduction of metal oxides. 4,571,259, Cl. 75-10.00R.

Fiat Auto S.p.A.: *See*—
Titolo, Andrea, 4,570,581, Cl. 123-90.180.

Fidler, Isaiah J.: *See*—
Schroit, Alan J.; and Fidler, Isaiah J., 4,571,332, Cl. 424-1.100.

Field, Martin J.: *See*—
Atkins, Terrance J.; Field, Martin J.; and Nolan, Daniel, 4,570,600, Cl. 123-468.000.
Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., 4,570,602, Cl. 123-468.000.

Finch, Jack N.; and Sprague, Janice S., to Phillips Petroleum Company. Asphalt compositions. 4,571,269, Cl. 106-273.00R.

Finkelman, Steven L.; and Tseitlin, Moshe, to M. Y. Finkelman Company. Precision electronic measuring instruments. 4,570,349, Cl. 33-143.00L.

Firestone Tire & Rubber Company, The: *See*—
Graves, Daniel F., 4,570,690, Cl. 152-564.000.

Fischer, Kurt: *See*—
Tanner, Hans; and Fischer, Kurt, 4,571,168, Cl. 425-405.00R.

Fisher, Lee K.: *See*—
Cargill, Don A.; and Fisher, Lee K., 4,570,782, Cl. 198-345.000.

Fishman, Bernard; Hitchcock, Louise M.; and O'Reilly, Kevin J. Feline infectious peritonitis vaccine. 4,571,386, Cl. 435-235.000.

Fitzpatrick, Nigel P.: *See*—
Bamji, Pervez J. F.; and Fitzpatrick, Nigel P., 4,571,258, Cl. 75-10.00R.

Flanders Filters, Inc.: *See*—
Quante, M. John; and Cutler, Terry W., 4,570,391, Cl. 52-39.000.

Fleissner, Heinz, to Vepa Aktiengesellschaft. Sieve drum device with flame heating. 4,570,361, Cl. 34-115.000.

Flesher, Peter: *See*—
Symes, Ken C.; Langley, John; and Flesher, Peter, 4,571,422, Cl. 536-114.000.

Fletcher, Edward A., to University of Minnesota, Regents of the. Method for reducing damage associated with detonation and/or destructive knock. 4,570,589, Cl. 123-193.00P.

Flo-Con Systems, Inc.: *See*—
King, Patrick D., 4,570,908, Cl. 266-236.000.

Flo Trend Systems, Inc.: *See*—
Lott, W. Gerald, 4,571,296, Cl. 209-211.000.

Flowerday, Carl, to Prince Corporation. Visor covering. 4,570,990, Cl. 296-97.00H.

Focke & Co.: *See*—
Focke, Heinz; and Balmer, Oskar, 4,570,414, Cl. 53-373.000.
Focke, Heinz; and Mutschall, Hugo, 4,570,421, Cl. 53-491.000.

Focke, Heinz; and Balmer, Oskar, to Focke & Co. Apparatus for closing and transporting away especially pouch packs. 4,570,414, Cl. 53-373.000.

Focke, Heinz; and Mutschall, Hugo, to Focke & Co. Process and apparatus for closing cartons. 4,570,421, Cl. 53-491.000.

Fogg, Sidney G.: *See*—
Dolden, John G.; Fogg, Sidney G.; and Lidy, Werner A., 4,571,413, Cl. 524-199.000.

Fontenot, John E.; and Murphy, Richard D., to NL Industries, Inc. Method and apparatus for determining formation pressure. 4,570,480, Cl. 73-155.000.

Foote, Douglas C.: *See*—
Grinde, James E.; and Foote, Douglas C., 4,570,738, Cl. 180-196.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Display device. 4,570,787, Cl. 206-45.140.

Ford Motor Company: *See*—
Duffy, James J., 4,570,735, Cl. 180-142.000.
Samson, Rogelio G.; Koller, Paul L.; and Hideg, Laszlo, deceased, 4,570,598, Cl. 123-445.000.
Veling, Thomas R.; Wiklund, George C.; and Park, Kwang H., 4,570,317, Cl. 29-157.30A.
Waldorf, Raymond D., 4,570,736, Cl. 180-143.000.

Ford, Norman C., Jr., to Coulter Electronics of New England, Inc. Light scattering apparatus and method. 4,571,081, Cl. 356-349.000.

Foreman, Frederick J.: *See*—
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,570,278, Cl. 15-97.00R.

Forte, Paulino, to Union Carbide Corporation. Aromatic/nonaromatic separations. 4,571,295, Cl. 208-334.000.

Fortuna, Vincent E.: *See*—
MacLaughlin, Donald; and Fortuna, Vincent E., 4,571,281, Cl. 156-580.000.

Foster, Edward P.: *See*—
Derbidge, T. Craig; Mulholland, James A.; and Foster, Edward P., 4,570,551, Cl. 110-263.000.

Foster, Raymond K. Reciprocating floor conveyor method. 4,571,150, Cl. 414-786.000.

Foster Wheeler Energy Corporation: *See*—
Gregorious, David J.; Wilcox, Roger F.; and Burr, Roland R., 4,570,842, Cl. 228-48.000.
Rabe, George B., 4,571,475, Cl. 219-60.00A.

Fountain, William D., to Cooper LaserSonics, Inc. Sum-beam separator using critical angle. 4,571,030, Cl. 350-385.000.

Fournier, Paul J. E.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Adapter seal. 4,570,981, Cl. 285-332.300.

Fox Grinders, Inc.: *See*—
Richter, John M.; and Bair, James G., Jr., 4,570,385, Cl. 51-165.710.

Fox, Jeffrey. Electronic musical instrument with string-simulating switches. 4,570,521, Cl. 84-1.010.

Frain, Laura M.; and Petkus, Paul A., to Sherwin Williams Company, The. Single package zinc-rich coatings. 4,571,268, Cl. 106-1.170.

Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, to BASF Aktiengesellschaft. Aminopropanol derivatives of 2-hydroxy-β-phenyl-propiophenones, their preparation and therapeutic agents containing these compounds. 4,571,409, Cl. 514-652.000.

Franklin, Leonard N., Jr.: *See*—
Anderson, Stanley E.; and Franklin, Leonard N., Jr., 4,570,662, Cl. 137-117.000.

Frascaroli, Francesco; and Biondi, Carlo, to C.O.M. Cooperativa Operai Metallurgici s.c.r.l. Beam assembly. 4,570,408, Cl. 52-726.000.

Freeman, James J. Patient's garment. 4,570,268, Cl. 2-114.000.

Freermann, Johannes, to Carl Schmale GmbH & Co. KG. Apparatus for folding and reinforcing an edge portion of fabrics. 4,570,557, Cl. 112-147.000.

Frensch, Heinz; Albrecht, Konrad; and Frisch, Gerhard, to Hoechst Aktiengesellschaft. Process for the preparation of dispersions of plant protection agents. 4,571,088, Cl. 366-136.000.

Fricke, Gunter: *See*—
Zentgraf, Helmut; and Fricke, Gunter, 4,570,861, Cl. 241-24.000.

Friedman, James N.: *See*—
Ripka, Chester D.; Friedman, James N.; and Drago, Thomas E., 4,570,612, Cl. 126-360.00A.

Friedman, Robert H.; and Eakin, Bertram E., to Getty Oil Company. Process for extracting hydrocarbons from hydrocarbon bearing ores. 4,571,294, Cl. 208-11.0LE.

Friedrich, Wolfgang: *See*—
Brandenstein, Manfred; Haas, Roland; Hans, Rudiger; and Friedrich, Wolfgang, 4,571,222, Cl. 474-112.000.

Frielinghaus, Klaus H., to General Signal Corporation. Vital track circuit wheel detector. 4,570,882, Cl. 246-34.00R.

Frigoscandia Contracting AB: *See*—
Jonasson, Staffan M. O., 4,570,447, Cl. 62-80.000.

Frisbie, Jeffrey S.: *See*—
Samson, Wilfred J.; and Frisbie, Jeffrey S., 4,571,240, Cl. 604-96.000.

Frisch, Gerhard: *See*—
Frensch, Heinz; Albrecht, Konrad; and Frisch, Gerhard, 4,571,088, Cl. 366-136.000.

Frister, Manfred, to Robert Bosch GmbH. Corrosion-protected electrical circuit component. 4,571,612, Cl. 357-81.000.

Fritz, Ulrich; and Kelz, Rony, to Polygress Plastic GmbH. Bale of straw or hay. 4,570,789, Cl. 206-83.500.

Froning, Edward C.; and Graham, Gregory S., to Froning, Edward C. Needle guidance system. 4,571,243, Cl. 604-116.000.

Fuji Film Co.: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, 4,571,624, Cl. 358-212.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Makita, Fujio, 4,570,765, Cl. 192-3.560.

Fuji Photo Film Co., Ltd.: *See*—
Arakawa, Satoshi; Yamazaki, Hisashi; Yamazaki, Kikuo; and Matsuda, Terumi, 4,571,496, Cl. 250-484.100.
Harada, Toru; Hirano, Shigeo; Nakamura, Shigeru; and Shimamura, Isao, 4,571,376, Cl. 430-218.000.
Horikawa, Kazuo, 4,571,493, Cl. 250-327.200.
Ishikawa, Hiromi; and Noguchi, Masaru, 4,571,020, Cl. 350-3.710.
Kasuga, Akira; Matsufuji, Akihiro; Yamada, Yasuyuki; and Tsuji, Nobuo, 4,571,364, Cl. 428-336.000.
Kawaguchi, Hideo; Okita, Tsutomu; and Tamaki, Hiroyuki, 4,571,361, Cl. 428-328.000.
Nakayama, Yoshiaki; and Kiuchi, Takao, 4,571,042, Cl. 353-110.000.
Naruse, Yasuhito; and Inukai, Yuzo, 4,571,316, Cl. 264-22.000.
Noguchi, Yasuhiro; and Mihara, Yuji, 4,571,380, Cl. 430-589.000.
Oishi, Kengo; and Moriwaki, Masayoshi, 4,570,877, Cl. 242-199.000.
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Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,571,293, Cl. 204-418.000.
Yamada, Sadami; and Tamura, Kaoru, 4,571,140, Cl. 414-412.000.

Fuji Photo Optical Co., Ltd.: *See*—
Horio, Motohiko; Kobayashi, Naoki; and Kaneko, Kouji, 4,571,629, Cl. 358-225.000.

Fuji Xerox Co., Ltd.: *See*—
Itoh, Satoru, 4,571,636, Cl. 358-285.000.
Shirai, Masaharu, 4,571,052, Cl. 355-3.0TR.

Yasuda, Keiryo, 4,571,065, Cl. 355-11.000.

Fujihashi, Mitsuru: *See—*
Kawamura, Miichiro; and Fujihashi, Mitsuru, 4,570,311, Cl. 28-164.000.

Fujiki, Makoto; and Takayama, Makoto, to Canon Kabushiki Kaisha. Information recording device. 4,571,641, Cl. 360-19.100.

Fujiki, Yasuo; and Hori, Toshio, to Murata Manufacturing Co., Ltd. Noise reduction filter. 4,571,561, Cl. 333-184.000.

Fujikura Cable Works, Limited, The: *See—*
Takaoka, Michio; Mohtai, Tsuneaki; Yoshida, Syotaroh; and Watanabe, Kazuo, 4,571,453, Cl. 174-110.00A.

Fujikura Ltd.: *See—*
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, 4,571,285, Cl. 204-1.00T.

Fujimori, Noboru: *See—*
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.

Fujimoto, Akira, to Omron Tateisi Electronics, Co. Semiconductor laser having an inverted layer in a plurality of stepped offset portions. 4,571,729, Cl. 372-46.000.

Fujinami, Hiroshi: *See—*
Takanabe, Kazunori; Yamamoto, Masaki; Ito, Kenzo; and Fujinami, Hiroshi, 4,571,684, Cl. 364-449.000.

Fujishima, Satoru: *See—*
Kawabata, Akira; Shiosaki, Tadashi; Takeda, Fumio; Fujishima, Satoru; and Ieki, Hideharu, 4,571,519, Cl. 310-313.00A.

Fujita, Yukihisa, to AMP Incorporated. Electrical connector assembly. 4,571,017, Cl. 339-59.00M.

Fujitsu Fanuc Limited: *See—*
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,571,687, Cl. 364-475.000.

Fujitsu Limited: *See—*
Kaku, Takashi; Unagami, Shigeyuki; and Inoue, Masayoshi, 4,571,733, Cl. 375-13.000.
Kashiwagi, Shunji, 4,571,611, Cl. 357-81.000.
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, 4,571,510, Cl. 307-449.000.
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Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
Yoshizawa, Takeshi, 4,570,279, Cl. 15-97.00R.

Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, to Hitachi, Ltd. Magnetic recording and reproducing apparatus. 4,571,652, Cl. 360-122.000.

Fujiwara, Hideo: *See—*
Ojima, Masahiro; Niihara, Toshio; and Fujiwara, Hideo, 4,571,650, Cl. 360-114.000.

Fukuchi, Eiji: *See—*
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Fukuchi, Masakazu: *See—*
Tarumi, Noriyoshi; Fukuchi, Masakazu; and Ito, Kunio, 4,571,068, Cl. 355-14.00D.

Fukuda, Hisatoshi, to Victor Company of Japan Ltd. Noise reduction circuit for a video signal using a feedback type comb filter and an equalizer circuit. 4,571,613, Cl. 358-36.000.

Fukuda, Kazuo, to Alps Electric Co., Ltd. Tape recorder. 4,571,644, Cl. 360-90.000.

Fukuda, Masao: *See—*
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Fukuda, Shuzo: *See—*
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Fukumi, Sigenobu: *See—*
Ohara, Toshio; Fukumi, Sigenobu; and Yamauchi, Yoshiyuki, 4,570,700, Cl. 165-134.100.

Fukuyama, Hiroomi; and Isobe, Shinichi, to Fujitsu Fanuc Limited. Screw cutting control system. 4,571,687, Cl. 364-475.000.

Fuller, William D.: *See—*
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,571,345, Cl. 426-548.000.

Fung, Paul J.: *See—*
Dalimonte, Alfred A.; and Fung, Paul J., 4,571,621, Cl. 358-186.000.

Furrow, Robert E.: *See—*
Amsler, Jerry D.; and Furrow, Robert E., 4,570,348, Cl. 33-129.000.

Furse, Anthony G. Method of multi-level encoding including synchronizing signals. 4,571,735, Cl. 375-20.000.

Furst, Arpad; and Igel, Richard, to Webasto-Werk W. Baier GmbH & Co. Tilt-out roof for vehicles. 4,570,992, Cl. 296-223.000.

Fushiki, Yasuo: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Fusion UV Curing Systems Corporation: *See—*
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Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; and Watanabe, Hiroshi, 4,571,523, Cl. 313-497.000.

Futamase, Tsuyoshi; and Kato, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Reverberation tone generating apparatus. 4,570,523, Cl. 84-1.240.

Fuzikawa, Kazuhiko: *See—*
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; and Fuzikawa, Kazuhiko, 4,571,310, Cl. 260-973.000.

G. A. Gray Division, The Warner & Swasey Company: *See—*
Holmstrom, Paul E.; and Ogrinc, Joseph F., 4,570,313, Cl. 29-26.00A.

G. D. Societa' per Azioni: *See—*
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Gabard, Bernard L.: *See—*
Chatterjee, Shyam S.; Gabard, Bernard L.; and Jaggy, Hermann E. W., 4,571,407, Cl. 514-464.000.

Gable, Carl I., Jr., to Interface Flooring Systems, Inc. Interlocking carpet tile. 4,571,353, Cl. 428-33.000.

Gabriele, Valentino: *See—*
Pardo, Warren A.; Pardo, Richard J.; and Gabriele, Valentino, 4,571,091, Cl. 366-311.000.

Gallaro, Anthony V.; and Josephs, Mark A., to North American Philips Consumer Electronics Corp. Color CRT with arc suppression structure. 4,571,521, Cl. 313-402.000.

Gallatin, David M.: *See—*
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.

Gamm, Paul B., to Jung Corporation. Clavicle brace. 4,570,619, Cl. 128-78.000.

Gang-Nail Systems, Inc.: *See—*
Palacio, Joaquin J.; and Cristobal, Carlos C., 4,570,407, Cl. 52-693.000.
Rionda, Carlos S.; and Palacio, Joaquin J., 4,571,114, Cl. 403-400.000.

Gardiner, Phillip J.: *See—*
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Gary W. Clem, Inc.: *See—*
Osborn, Harley G., 4,570,722, Cl. 172-311.000.

Gas Research Institute: *See—*
Himmel, Robert L., 4,570,610, Cl. 126-39.00E.

Gates, Jan E.: *See—*
Cage, James K.; Kolla, Shanti; and Gates, Jan E., 4,571,337, Cl. 426-107.000.

Gates Rubber Company, The: *See—*
Stieg, Richard F.; Dolan, John P.; Worley, Wm. Spencer; and Gerbert, Goran, 4,571,216, Cl. 474-8.000.

Gaudyn, Tad J. Three dimensional projection arrangement. 4,571,041, Cl. 353-10.000.

Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Multi-turn coils of controlled pitch for electromagnetic casting. 4,570,699, Cl. 164-503.000.

Gay, Michael J.; and Gutmann, Johannes, to Motorola, Inc. Voltage controlled crystal oscillator with reduced oscillations at crystal overtones. 4,571,558, Cl. 331-105.000.

Gebelein, Rolin J.; and Shafer, David, to Gebelein, Rolin J. Reflecting telescope with correcting lens. 4,571,036, Cl. 350-503.000.

Gees, Jurg: *See—*
Ziegler, Klaus; Zund, Peter; Gees, Jurg; and Mader, Josef, 4,571,028, Cl. 350-287.000.

Gehse, Hartmut, to Dornier GmbH. Arrangement of devices to sever and remove canopy wall sections from aircraft cockpits. 4,570,880, Cl. 244-122.0AF.

Geiger, Avi: *See—*
Labock, Yoram; Feuerstein, Israel; and Geiger, Avi, 4,571,455, Cl. 179-2.00A.

Geisler, Thomas A., to National Refractories & Minerals Corporation. Method of constructing a steelmaking ladle. 4,570,910, Cl. 266-284.000.

Gelmetti, Marco: *See—*
Mantellina, Calogero; Zanzottera, Daniele; and Gelmetti, Marco, 4,571,676, Cl. 364-200.000.

Gelula, Jerome D. Coupling system with cable. 4,570,310, Cl. 24-645.000.

Genentech, Inc.: *See—*
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General Electric Company: *See—*
Chastine, Gary L., 4,571,517, Cl. 310-68.00C.
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, 4,571,322, Cl. 264-154.000.
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Germer, Warren R., 4,571,692, Cl. 364-483.000.
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Jones, Donald W., 4,570,333, Cl. 29-598.000.
LeGrand, Donald G.; and Olszewski, William V., 4,571,280, Cl. 156-329.000.
Mewitz, Gerd, 4,571,619, Cl. 358-160.000.
Noe, Raymond J., 4,571,252, Cl. 65-82.000.
Paul, Duane B., 4,571,151, Cl. 415-1.000.
Rabatin, Jacob G., 4,571,305, Cl. 252-301.40H.
Renlund, Gary M.; and Johnson, Curtis A., 4,571,414, Cl. 524-322.000.
Silva, James M., 4,571,425, Cl. 549-241.000.
Smith, Peter H.; and Dills, Raymond L., 4,571,581, Cl. 340-600.000.

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General Foods Corporation: *See*—
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Ferrante, Joseph G.; Victoria, Henry J.; and Mileos, George, 4,571,340, Cl. 426-393.000.
Katz, Saul N.; and Vogel, Gerald J., 4,571,339, Cl. 426-387.000.
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.
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General Instrument Corporation: *See*—
Robbins, Clyde; and Morenilla, Luis, 4,571,615, Cl. 358-120.000.
General Motors Corporation: *See*—
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Atkins, Terrance J.; Field, Martin J.; and Nolan, Daniel, 4,570,600, Cl. 123-468.000.
Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., 4,570,602, Cl. 123-468.000.
Ballantyne, David B., 4,570,893, Cl. 248-487.000.
Baluch, Donald T.; and Zimmerman, Paton M., Jr., 4,571,319, Cl. 264-40.100.
Beardmore, John M., 4,571,159, Cl. 417-366.000.
Kurtti, Gary R., 4,570,873, Cl. 242-107.40A.
Lindow, Dale W., 4,571,133, Cl. 411-11.000.
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Masica, Michael T.; Wong, Albert C.; and Yonker, John F., 4,570,667, Cl. 137-117.000.
Molloy, Edward W., 4,571,223, Cl. 474-133.000.
Molloy, Edward W.; and Richard, Raymond L., Jr., 4,571,226, Cl. 474-190.000.
Nicholson, Michael A.; and Kosmanski, Thomas J., 4,570,508, Cl. 74-535.000.
Osterday, John R., 4,570,283, Cl. 15-250.210.
Pangos, William, 4,570,972, Cl. 280-714.000.
Troxell, John R., 4,571,348, Cl. 427-38.000.
Walker, James D., 4,571,320, Cl. 264-40.100.
General Signal Corporation: *See*—
Frielinghaus, Klaus H., 4,570,882, Cl. 246-34.00R.
Right, Robert W., 4,571,586, Cl. 340-825.510.
Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., 4,571,090, Cl. 366-270.000.
Genev, Evtim V.: *See*—
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., to ISO "Metalurgkomplekt". Disc crusher. 4,570,864, Cl. 241-252.000.
Genik-Sas-Berezowsky, Roman M.: *See*—
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,571,263, Cl. 75-101.00R.
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,571,264, Cl. 75-101.00R.
Genini, Maurice; and Szabo, Rene , to Coflexip. System and apparatus of liason between an underwater wellhead and a surface support. 4,570,716, Cl. 166-346.000.
Gentili, Piergiorgio: *See*—
Picciola, Giampaolo; Gentili, Piergiorgio; Ravenna, Franco; and Riva, Mario, 4,571,401, Cl. 514-332.000.
Geo Vann, Inc.: *See*—
Turner, Dewayne; Menard, Raymond A.; and Oneal, Dean, 4,570,714, Cl. 166-278.000.
Georg Fischer Aktiengeselleschaft: *See*—
Tanner, Hans; and Fischer, Kurt, 4,571,168, Cl. 425-405.00R.
Georg Spiess GmbH: *See*—
Marass, Josef, 4,570,917, Cl. 270-53.000.
Geo. A. Hormel & Co.: *See*—
Tribbett, Kenneth E., 4,570,298, Cl. 17-41.000.
Gerbert, Goran: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, Wm. Spencer; and Gerbert, Goran, 4,571,216, Cl. 474-8.000.
Gerfen, Raymond F. Cylindrical, falling breech block, rifle action. 4,570,369, Cl. 42-23.000.
Gerin, Merlin: *See*—
Demeyer, Pierre; and Duval, Philippe, 4,571,659, Cl. 361-95.000.
Gerlach, Pierre; and Grolleau, Claude, to Thomson-CSF. Resonant coaxial cavities for a grid vacuum tube. 4,571,525, Cl. 315-39.000.
Germer, Warren R., to General Electric Company. Electronic demand register. 4,571,692, Cl. 364-483.000.
Gerontopoulos, Panaiotis; Cogliati, Guido; and Richter, Karl, to AGIP Nucleare S.p.A.; and CNEN-Comitato Nazionale per l'Energia Nucleare. Preparing ceramic material pellets. 4,571,315, Cl. 264-0.500.
Gerst, Michael D.: *See*—
Wendt, Charles W.; Shroder, Joseph D.; and Gerst, Michael D., 4,570,378, Cl. 47-9.000.
Gerstner, Norman G. Floor jack assembly for removing auto differentials. 4,570,905, Cl. 254-134.000.
Getty Oil Company: *See*—
Friedman, Robert H.; and Eakin, Bertram E., 4,571,294, Cl. 208-11.0LE.
Gewerkschaft Eisenhutte Westfalia: *See*—
Merten, Gerhard; and Lagodka, Gunter, 4,571,127, Cl. 405-299.000.
Roling, Franz; Merten, Gerhard; and Steinkuhl, Bernd, 4,571,003, Cl. 299-33.000.
Ghibu, Michael; Hartel, Volker; Heynemann, Carl; and Raubach, Manfred, to Metzeler Kautschuk GmbH. Co-oscillating, volume-changing resonator in the form of a silencer. 4,570,748, Cl. 181-286.000.
Giboney, George W.; Vanlandingham, Robert E.; and Grimshaw, James L. Retractable trailer hitch ball. 4,570,966, Cl. 280-433.000.
Gieson, Clarence L., to Metromail Corporation. Pallet unloading fixture. 4,571,141, Cl. 414-417.000.
Gietl, Albert: *See*—
Nowak, Franz; Gietl, Albert; Leo, Rolf; and Singer, Gerhard, 4,571,005, Cl. 301-63.0PW.
Gilbarco Inc.: *See*—
Devine, George T., 4,570,686, Cl. 141-286.000.
Gino, Donati. Device for the automatic boxing of bags or sachets into containers. 4,570,418, Cl. 53-435.000.
Giordano, Salvatore J. Barking dog simulated alarm system. 4,571,583, Cl. 340-692.000.
Giubileo, Giancarlo, to Societa' Cavi Pirelli S.p.A. Electric cable sealing end. 4,571,452, Cl. 174-77.00R.
Givaudan Corporation: *See*—
Schenk, Hanspeter, 4,570,648, Cl. 131-276.000.
GKN Technology Limited: *See*—
Barlow, John, 4,570,693, Cl. 164-112.000.
Glaenzer Spicer: *See*—
Orain, Michel A., 4,571,214, Cl. 464-111.000.
Glaxo Group Limited: *See*—
Hayes, Roger; Bays, David E.; and MacKinnon, John W. M., 4,571,394, Cl. 514-212.000.
Gluck, Robert F.: *See*—
Das, Subrata K.; Dixon, Norman R.; and Gluck, Robert F., 4,570,746, Cl. 181-242.000.
Gmeinder, Hermann: *See*—
Beier, Stefan; and Gmeinder, Hermann, 4,571,681, Cl. 364-413.000.
Gmeiner, Gunter; Hugger, William; and Binder, Rudolf, to Daimler-Benz Aktiengesellschaft. Sun visor for vehicles provided with a protective sun visor plate. 4,570,989, Cl. 296-97.00J.
Gnerlich, Hans R.; and Zimmermann, Kuno P., to MI Medical & Scientific Instruments, Inc. Randomized-clock circuit. 4,571,556, Cl. 331-78.000.
Goguillon, Claude: *See*—
Taupin, Pierre; Goguillon, Claude; and de Moncuit, Frederic, 4,571,577, Cl. 340-347.00R.
Golden, Donald M., to Ethicon, Inc. Surgical clip applier instrument adapter jaws. 4,570,633, Cl. 128-325.000.
Goldstein, Leon C., to An-Rix, Inc. Cold recapping method for tires utilizing uncured rubber and compressible mold. 4,571,277, Cl. 156-96.000.
Goldwasser, Maurice: *See*—
Allemand, Louis R.; Calvet, Jean; Cavan, Jean-Claude; Goldwasser, Maurice; and Thevenin, Jean-Claude, 4,571,313, Cl. 264-1.500.
Golobay, Gary L. Magnetic clutch-brake mechanism. 4,570,766, Cl. 192-18.00R.
Gomes, Robert L.; and Maffione, Joseph P., to Andover Medical Incorporated. Electrode. 4,570,637, Cl. 128-639.000.
Gongwer, Calvin A., to Allied Corporation. Self propelled spherical vehicle. 4,571,192, Cl. 440-66.000.
Goodman, Murray: *See*—
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, 4,571,345, Cl. 426-548.000.
Goodwin, John D.; and Mulkey, Forrest W., III, to Molly Maguire, Inc. Rice hull ash compositions. 4,571,389, Cl. 501-85.000.
Goss, Lloyd C., to Magnetic Peripherals, Inc. Disk drive carriage structure. 4,571,649, Cl. 360-106.000.
Goto, Masana: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.
Goto, Shobun; Sugihara, Jiro; and Yabusaki, Masayoshi, to Kabushiki Kaisha Kibun. Apparatus for scoring and coiling fish paste. 4,571,167, Cl. 425-289.000.
Gottlieb, G. Eugene, to Burroughs Corporation. Method of testing plastic-packaged semiconductor devices. 4,571,093, Cl. 374-57.000.
Gould, Charles M.; and Blake, Andy F., to Shasta Industries, Inc. Distribution valve with dual cams to prevent uncontrolled excursions of valve balls. 4,570,663, Cl. 137-119.000.
Gould, Walter. Solar motor means. 4,570,444, Cl. 60-675.000.
Gourneau, Dwight A.: *See*—
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.
Goward, Stanley H., to BTR plc. Staple coupling. 4,570,980, Cl. 285-305.000.
Grafwallner, Karl L.: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,571,665, Cl. 362-225.000.
Graham, Gregory S.: *See*—
Froning, Edward C.; and Graham, Gregory S., 4,571,243, Cl. 604-116.000.
Graindorge, Philippe: *See*—
Papuchon, Michel; Arditty, Herve ; Graindorge, Philippe; and Huignard, Jean-Pierre, 4,571,080, Cl. 356-345.000.

Granger, Mark A.: *See*—
Klett, Paul A.; Bakhshi, Shiv K.; and Granger, Mark A., 4,570,859, Cl. 239-455.000.

Grangereau, Jean A. M., to Drusch et Cie. Device for maintaining and fixing coils provided for making a constant and homogeneous magnetic field. 4,571,568, Cl. 335-299.000.

Granstrom, Bengt P. O.; and Skogberg, Bo T., to Atlas Copco Aktiebolag. Expansion body. 4,571,126, Cl. 405-244.000.

Grasselli, Robert K.: *See*—
DiCosimo, Robert; Burrington, James D.; and Grasselli, Robert K., 4,571,443, Cl. 585-428.000.
Ward, Michael D.; Brazdil, James F., Jr.; and Grasselli, Robert K., 4,571,290, Cl. 204-157.690.

Graube, Peteris E. Funnel teaching method and apparatus. 4,571,191, Cl. 434-126.000.

Graves, Daniel F., to Firestone Tire & Rubber Company, The. Mixing procedure for obtaining filled rubber vulcanizates containing aromatic furazan oxides. 4,570,690, Cl. 152-564.000.

Gray Tool Company: *See*—
Karr, Michael A., Jr., 4,570,659, Cl. 137-72.000.
Robison, Hollis G., 4,570,724, Cl. 175-113.000.

Gray, William H., Sr. Door lock security device. 4,570,470, Cl. 70-428.000.

Greco, Vincent. Locking system for rolling type gate. 4,570,467, Cl. 70-99.000.

Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., to United States of America, Health and Human Services. Genetic reassortment of rotaviruses for production of vaccines and vaccine precursors. 4,571,385, Cl. 435-172.300.

Gregorious, David J.; Wilcox, Roger F.; and Burr, Roland R., to Foster Wheeler Energy Corporation. Conduit weld positioner with arc length adjustor. 4,570,842, Cl. 228-48.000.

Greskovich, Charles D.; Cusano, Dominic A.; and DeBianca, Frank A., to General Electric Company. Preparation of yttria-gadolinia ceramic scintillators by sintering and gas hot isostatic pressing. 4,571,312, Cl. 264-1.200.

Grid Systems Corporation: *See*—
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.

Gries, Josef: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Griffin, Eric J.; and Slack, Gordon J., to Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The. Six-port reflectometer. 4,571,545, Cl. 324-58.00B.

Griffith, John D., to Sulzer Brothers Limited. Yarn holding device. 4,570,683, Cl. 139-194.000.

Griggs, Colin G., to British Petroleum Company, p.l.c., The. Photochemical process for the production of alkylene glycols. 4,571,289, Cl. 204-157.900.

Grimes, Roger, to Alcan International Limited. Light metal alloys, product and method of fabrication. 4,571,272, Cl. 148-11.50A.

Grimshaw, James L.: *See*—
Giboney, George W.; Vanlandingham, Robert E.; and Grimshaw, James L., 4,570,966, Cl. 280-433.000.

Grinde, James E.; and Foote, Douglas C., to Yamaha Hatsudoki Kabushiki Kaisha. Snow vehicle equipped with wide, low-pressure tires. 4,570,738, Cl. 180-196.000.

Grinnell Fire Protection Systems Company, Inc.: *See*—
Wilk, David A., deceased, 4,570,719, Cl. 169-20.000.

Grinwald, Israel M., to United States of America, Army. Dolly unit. 4,570,959, Cl. 280-43.230.

Grolleau, Claude: *See*—
Gerlach, Pierre; and Grolleau, Claude, 4,571,525, Cl. 315-39.000.

Groom, James S., to Westvaco Corporation. Package for floppy disk envelopes. 4,570,796, Cl. 206-449.000.

Groth, Hugh F.; and Collins, John M., to Regina Corporation. Liquid and detergent mixing chamber and valves. 4,570,856, Cl. 239-310.000.

Gruber, George J., to Southwest Research Institute. Multibeam satellite-pulse observation technique for characterizing cracks in bimetallic coarse-grained component. 4,570,487, Cl. 73-624.000.

Grumman Aerospace Corporation: *See*—
Angeloff, Lloyd G., 4,571,155, Cl. 416-13.000.

GTE Automatic Electric Incorporated: *See*—
Jaster, Dale R., 4,571,532, Cl. 320-2.000.

GTE Laboratories Incorporated: *See*—
Cogan, Adrian I., 4,570,330, Cl. 29-576.00W.

Gudat, Gerhard; Blascyk, Gotthardt; and Wingenfeld, Friedrich, to Krupp Polysius AG. Bucket wheel valve. 4,571,176, Cl. 432-226.000.

Gude, Fritz; and von Praun, Ferdinand, to Chemische Werke Huls AG. Process for the production of maleic anhydride. 4,571,426, Cl. 549-257.000.

Gudlauski, Edward B.; and Wagner, Thomas R., to United Technologies Corporation. Machine for blending and degassing powders. 4,571,089, Cl. 366-139.000.

Guerriero, Frederico D. Circulo-segmental spanning and holding apparatus. 4,570,621, Cl. 128-84.00C.

Guidoux, Loic B. Y.: *See*—
Brie, Richard; and Guidoux, Loic B. Y., 4,571,465, Cl. 179-170.200.
Chevreau, Jean-Philippe J.; and Guidoux, Loic B. Y., 4,571,720, Cl. 370-32.000.

Guidry, Donald C.; and Guidry, Ronald H. Tailgate ramp for attaching to the tailgate of a truck. 4,571,144, Cl. 414-537.000.

Guidry, Ronald H.: *See*—
Guidry, Donald C.; and Guidry, Ronald H., 4,571,144, Cl. 414-537.000.

Gundisch, Gusztav: *See*—
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, 4,570,964, Cl. 280-403.000.

Gustafson, Thomas L.: *See*—
Nevins, Norman; and Gustafson, Thomas L., 4,571,410, Cl. 523-122.000.

Gutmann, Johannes: *See*—
Gay, Michael J.; and Gutmann, Johannes, 4,571,558, Cl. 331-105.000.

Guttler, Hermann; and Lagemann, Bernd, to Zinser Textilmaschinen GmbH. Thread guard for spinning or twisting machine. 4,570,429, Cl. 57-81.000.

Guzzoni, Gianfranco: *See*—
Premi, Mauro; and Guzzoni, Gianfranco, 4,570,427, Cl. 57-22.000.

Gysling, Walter: *See*—
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., 4,571,645, Cl. 360-98.000.

Gyugyi, Laszlo, to Westinghouse Electric Corp. VAR Generator having controlled discharge of thyristor switched capacitors. 4,571,535, Cl. 323-211.000.

Haaland, Harold H.: *See*—
Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., 4,571,330, Cl. 423-242.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; Hans, Rudiger; and Friedrich, Wolfgang, 4,571,222, Cl. 474-112.000.

Haberle, Friedrich: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,571,130, Cl. 408-143.000.

Hack, Walter: *See*—
Herdin, Gunther H.; and Hack, Walter, 4,570,588, Cl. 123-198.0DB.

Hackl, Ralph P.: *See*—
Bruynesteyn, Albert; Hackl, Ralph P.; Lawrence, Richard W.; and Vizsolyi, Andrew I., 4,571,387, Cl. 435-262.000.

Hafele KG: *See*—
Erlebach, Gustav; Holze, Roland; and Koch, Gerhard, 4,571,115, Cl. 403-402.000.

Hagan Engineering, Inc.: *See*—
Hagan, James C.; and Hagan, Owen C., 4,571,498, Cl. 250-560.000.

Hagan, James C.; and Hagan, Owen C., to Hagan Engineering, Inc. Apparatus for interrogating phototransistors and the like. 4,571,498, Cl. 250-560.000.

Hagan, Owen C.: *See*—
Hagan, James C.; and Hagan, Owen C., 4,571,498, Cl. 250-560.000.

Hagel, Adolf, to Liba Maschinenfabrik GmbH. Compound needle for warp knitting machine. 4,570,459, Cl. 66-120.000.

Hagino, Hideyuki: *See*—
Koga, Takashi; and Hagino, Hideyuki, 4,571,508, Cl. 307-360.000.

Haglund, Lennart, to AB Stil-Industri. Vehicle safety belt lock having an electric contact. 4,571,471, Cl. 200-61.58B.

Hahn, Joachim: *See*—
Melzer, Harald; and Hahn, Joachim, 4,570,334, Cl. 29-700.000.

Hahn, Norbert; and Swessel, Michael A., to Rite-Hite Corporation. Leveler assembly. 4,570,277, Cl. 14-71.300.

Haisma, Jan; and Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Device for displaying three-dimensional images. 4,571,616, Cl. 358-88.000.

Hakansson, Bengt E. W. Fastening device. 4,571,001, Cl. 297-483.000.

Halbach & Braun Industrieanlagen: *See*—
Braun, Ernst; and Braun, Gert, 4,571,004, Cl. 299-34.000.

Hale Fire Pump Company: *See*—
Eberhardt, H. Alfred, 4,570,605, Cl. 123-576.000.

Hall, Charles J., to Dixie Canada Inc. Carton closure releasable by deformation. 4,570,845, Cl. 229-33.000.

Hall, David R., to Megadiamond Industries, Inc. Curved contact portion on engaging elements for rotary type drag bits. 4,570,726, Cl. 175-410.000.

Halliburton Company: *See*—
Kendrick, William D.; and Mayfield, Terry D., 4,570,673, Cl. 137-615.000.

Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Engine starter protecting device. 4,570,583, Cl. 123-179.00K.

Hambleton, Thomas P.; and Triggiani, Richard R., to International Paper Company. Slideable reclosable plastic lid. 4,570,817, Cl. 220-345.000.

Hamilton, James C., to Sybron Corporation. Occlusal matrix for light cured composites. 4,571,188, Cl. 433-226.000.

Hammer, Helmut: *See*—
Bock, Erich; Hammer, Helmut; and Postler, Gunther, 4,570,541, Cl. 102-216.000.

Hammerschmidt, Horst E.: *See*—
Blank, Michael G.; and Hammerschmidt, Horst E., 4,571,171, Cl. 425-533.000.

Han, Eui M., to Shinhan Kongki Co. Ltd. Double casing water meter. 4,570,497, Cl. 73-861.790.

Hanaki, Akira, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Rotary direction detecting sensor. 4,571,469, Cl. 200-61.540.

Hand-Held Products, Inc.: *See*—
DeArras, James M., 4,571,702, Cl. 364-900.000.

Hans, Rudiger: *See*—
Brandenstein, Manfred; Haas, Roland; Hans, Rudiger; and Friedrich, Wolfgang, 4,571,222, Cl. 474-112.000.

Hansen, Michael S., to Boroloy Industries International, Inc. Vibration dampener apparatus. 4,571,215, Cl. 464-180.000.

Hanson, Steven P.: *See*—
Zaruba, John V.; Meyer, Burton C.; and Hanson, Steven P., 4,571,205, Cl. 446-230.000.

Hara, Kuniko: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.

Hara, Kunitaka, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,570,740, Cl. 180-229.000.

Hara, Takafumi, to Sharp Kabushiki Kaisha. Nozzle blockage preventing unit in an ink jet system printer. 4,571,600, Cl. 346-140.00R.

Harada, Toru; Hirano, Shigeo; Nakamura, Shigeru; and Shimamura, Isao, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic film unit with 1-M-(methyl or ethyl)phenyl-4-methyl-4-hydroxymethyl pyrazolidinones. 4,571,376, Cl. 430-218.000.

Harben, Grover S., Jr.; and Sosebee, Robert J. Peeler roll construction. 4,570,293, Cl. 17-11.000.

Hardy, Alfred E.: *See*—
Kerney, Robert A.; and Hardy, Alfred E., 4,570,475, Cl. 72-412.000.

Hargarten, James W.: *See*—
Romano, Paul M.; Baer, James W.; and Hargarten, James W., 4,571,712, Cl. 369-44.000.

Harper, James T.: *See*—
Bonasso, Jack I.; Harper, James T.; and Verhoff, Francis K., 4,571,249, Cl. 48-73.000.

Harr, Milton E.: *See*—
Elton, David J.; and Harr, Milton E., 4,571,695, Cl. 364-550.000.

Harris, John D.; and Evans, Mervyn, to National Research Development Corporation. Apparatus for external fixation of bone fractures. 4,570,625, Cl. 128-92.00G.

Harris, Richard L.: *See*—
Horst, Robert W.; and Harris, Richard L., 4,571,673, Cl. 364-200.000.

Harrison, Neil, to I.H.W. Engineering Ltd. Reclining seat particularly for vehicles. 4,570,999, Cl. 297-362.000.

Hartel, Volker: *See*—
Ghibu, Michael; Hartel, Volker; Heynemann, Carl; and Raubach, Manfred, 4,570,748, Cl. 181-286.000.

Harth, Arthur R.: *See*—
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.

Hartshorn, Kevin, to Ingersoll-Rand Company. Unidirectional, fluid control valve. 4,570,666, Cl. 137-512.100.

Hartung, Michael H., to International Business Machines Corporation. Peripheral storage system having multiple data transfer rates. 4,571,674, Cl. 364-200.000.

Hartwell Corporation: *See*—
Anderson, John P., 4,570,290, Cl. 16-229.000.

Hasegawa, Shumpei; and Kishi, Noriyuki, to Honda Giken Kogyo K.K. Air-fuel ratio feedback control system for internal combustion engines, capable of achieving proper air-fuel ratios from the start of the engine. 4,570,599, Cl. 123-489.000.

Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. System for controlling throttling of intake air and pressure of fuel injection in diesel engine. 4,570,591, Cl. 123-331.000.

Hashimoto, Nobuyuki: *See*—
Nishio, Shigeru; and Hashimoto, Nobuyuki, 4,570,676, Cl. 137-870.000.

Hashizume, Takeshi; and Onoda, Hiroshi, to Nihon Tokusan Kabushiki Kaisha. Oligo-imino-amines possessing plant-physiological activities and process for preparing the same. 4,571,434, Cl. 564-103.000.

Hasili, Jacob P., to RCA Corporation. Apparatus and method for measuring and displaying the pulse width of a video signal. 4,571,617, Cl. 358-107.000.

Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, to Sumitomo Electric Industries, Ltd. Electrically insulating laminate paper for oil-impregnated electric apparatus. 4,571,357, Cl. 428-153.000.

Hatada, Minoru; Ishida, Hideaki; and Matsushita, Masatoshi, to Hitachi, Ltd.; and Hitachi Micro Computer Engineering Ltd. Access control method for multiprocessor systems. 4,571,672, Cl. 364-200.000.

Hatagishi, Shingo, to Yoshida Kogyo K.K. Apparatus for inserting slider for concealed fastener. 4,570,335, Cl. 29-768.000.

Hatano, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Stacked MOS device with means to prevent substrate floating. 4,571,609, Cl. 357-41.000.

Hatori, Yoshinori; Murakami, Hitomi; and Matsumoto, Shuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. TV Signal median prediction coding system. 4,571,618, Cl. 358-136.000.

Hattori, Jun: *See*—
Kato, Masatake; Kitagishi, Nozomu; and Hattori, Jun, 4,571,033, Cl. 350-427.000.

Hattori, Motoichi; and Ishigo, Hideyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic telephone answering and recording apparatus. 4,571,457, Cl. 179-2.0EA.

Hattori, Yoshio, to Niles Parts Co., Ltd. Turn signal switching device. 4,571,470, Cl. 200-61.540.

Hauni-Werke Korber & Co. KG: *See*—
Rudszinat, Willy; and Pawelko, Karl-Heinz, 4,571,231, Cl. 493-11.000.

Haupt, Randy L., to United States of America, Air Force. Directional antenna system having sidelobe suppression. 4,571,594, Cl. 343-840.000.

Haury, Andree : *See*—
Belbel, Elie; Haury, Andree ; Blanchard, Christian; and Lauraire, Michel, 4,571,565, Cl. 335-16.000.

Haussmann, Gerhard: *See*—
Deutschmann, Herbert; Haussmann, Gerhard; and Kamleitner, Ewald, 4,570,442, Cl. 60-612.000.

Hawkins, Gene, to Sunbeam Plastics Corporation. Cap with tamper indicating band. 4,570,810, Cl. 215-253.000.

Hayashi, Hajime: *See*—
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.

Hayashi, Masaharu: *See*—
Yamaguchi, Hiorji; Hori, Takanobu; and Hayashi, Masaharu, 4,570,771, Cl. 192-58.00B.

Hayashi, Masamichi; and Tokura, Yukio, to Minolta Camera Kabushiki Kaisha. Optical element positioning apparatus for use in electrophotographic copying machine. 4,571,064, Cl. 355-8.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Light metal cylinder head with valve seat insert. 4,570,585, Cl. 123-188.00S.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Piston ring having shape of an ellipse or an elongated circle. 4,570,945, Cl. 277-197.000.

Hayashida, Akira: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.

Hayes, Roger; Bays, David E.; and MacKinnon, John W. M., to Glaxo Group Limited. Heterocyclic derivatives. 4,571,394, Cl. 514-212.000.

HB BGM Innovation: *See*—
Malmgren, Bengt-Goran, 4,571,137, Cl. 414-173.000.

Head, Manley J., to Rockwell International Corporation. QAM Demodulator carrier recovery loop using n-m LSB's. 4,571,550, Cl. 329-50.000.

Heasley, Raymond E.: *See*—
Anderson, Harry E.; and Heasley, Raymond E., 4,570,907, Cl. 266-69.000.

Heath, Richard W., to Tolco, Incorporated. Hanger clamp body and method of forming same. 4,570,885, Cl. 248-72.000.

Heaton, Harry H., III: *See*—
Petrofsky, Jerrold S.; Phillips, Chandler A.; and Heaton, Harry H., III, 4,570,927, Cl. 272-73.000.

Hebard, Elaine: *See*—
Schneider, Eric C.; Hebard, Elaine; and Rumley, Stuart D., 4,571,638, Cl. 358-293.000.

Hedenstierna, Lars E.: *See*—
Jonsson, Nils I.; and Hedenstierna, Lars E., 4,570,664, Cl. 137-202.000.

Hedlund, Martin L.: *See*—
Buren, Kurt J. A.; Hedlund, Martin L.; and Lundstrom, Malkolm S., 4,571,261, Cl. 75-77.000.

Hege, Hans-Guenther: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Heimbigner, Thomas; and Stranahan, Phillip. Fluid collet chuck. 4,570,952, Cl. 279-20.000.

Heitzmann, Michel: *See*—
Henry, Raymond; Heitzmann, Michel; and Bouvet, Jean V., 4,571,559, Cl. 333-17.00L.

Hellerich, Gary L. Means for transporting and delivering dry chemicals. 4,571,143, Cl. 414-523.000.

Henderson, James M.: *See*—
King, Robert D.; and Henderson, James M., 4,571,160, Cl. 417-437.000.

Henderson, Richard E.; and Wittenberg, Mark S., to Mattel, Inc. Exercise toy for doll. 4,571,207, Cl. 446-352.000.

Hendricks, Wayne D., to Wehr Corporation. Manual control for releasably holding a spring applied/electrically released brake disengaged. 4,570,758, Cl. 188-72.300.

Hengstler GmbH Geschaftsbereich, Haller-Relais: *See*—
Nestlen, Wolfgang; and Scheffler, Michael, 4,571,567, Cl. 335-128.000.

Henig, Ronald. Electrical device for alleviating earache pain. 4,570,635, Cl. 128-380.000.

Hennemann, Thomas L., Jr.: *See*—
Larson, Spencer B.; Johnson, Richard H.; Hennemann, Thomas L., Jr.; and Copeland, James L., 4,571,327, Cl. 422-263.000.

Henry Ford Hospital: *See*—
Wu, Kent K., 4,570,618, Cl. 128-69.000.
Wu, Kent K., 4,570,624, Cl. 128-92.0EB.

Henry, James W.; and Mumpower, Robert C., to Eastman Kodak Company. Method for continuously measuring the perimeter of wrapped objects. 4,571,497, Cl. 250-560.000.

Henry, Raymond; Heitzmann, Michel; and Bouvet, Jean V., to Thomson-CSF. High-power waveguide limiter comprising PIN diodes for millimeter waves. 4,571,559, Cl. 333-17.00L.

Herceg, Joseph E.: *See*—
Dunn, Patrick F.; Herceg, Joseph E.; and Klocksieben, Robert H., 4,570,494, Cl. 73-863.220.

Herdin, Gunther H.; and Hack, Walter, to Steyr-Daimler-Puch Aktiengesellschaft. Apparatus for automatically controlling the injection of fuel in diesel engines. 4,570,588, Cl. 123-198.0DB.

Herman, Martin A. Elevator indicator support-bow gage assembly. 4,570,356, Cl. 33-552.000.

Hermann Finckh Maschinenfabrik GmbH & Co.: *See*—
Holz, Emil, 4,571,298, Cl. 210-498.000.

Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, to ESPE Fabrik pharmazeutischer Praeparate GmbH. Apparatus for treating dental materials. 4,571,665, Cl. 362-225.000.

Herr, Friedhelm, to Deere & Company. Process for loading a shipping container with vehicles. 4,570,417, Cl. 53-428.000.

Herrington, Fox J., to Mobil Oil Corporation. Bag folding and loading machine having improved swatter. 4,570,411, Cl. 53-117.000.

Herron, B. Keith. Method and apparatus for smoking. 4,570,646, Cl. 131-185.000.

Hery, Yves: *See*—
Bonniaud, Roger; Jouan, Antoine; and Hery, Yves, 4,571,307, Cl. 252-628.000.

Herzog, Alexander; Honomichl, Larry L.; Nagda, Jagdish M.; and Rehage, Teddy A., to International Business Machines Corporation. Optical mark recognition for controlling input devices, hosts, and output devices. 4,571,699, Cl. 364-900.000.

Hetzenecker, Heinz: *See*—
Othold, Rolf; and Hetzenecker, Heinz, 4,570,976, Cl. 285-4.000.

Heyman, Arnold M. Catheter-stylet assembly for slipover urethral instruments. 4,571,239, Cl. 604-54.000.

Heynemann, Carl: *See*—
Ghibu, Michael; Hartel, Volker; Heynemann, Carl; and Raubach, Manfred, 4,570,748, Cl. 181-286.000.

Hi-Speed Checkweigher Co., Inc.: *See*—
Del Rosso, Victor, 4,570,729, Cl. 177-145.000.

Hideg, Gizella, executrix: *See*—
Samson, Rogelio G.; Koller, Paul L.; and Hideg, Laszlo, deceased, 4,570,598, Cl. 123-445.000.

Hideg, Laszlo, deceased: *See*—
Samson, Rogelio G.; Koller, Paul L.; and Hideg, Laszlo, deceased, 4,570,598, Cl. 123-445.000.

Hidemi, Komine; and Hiroshi, Kato, to Amano Corporation. Parking station supervisory system. 4,571,490, Cl. 235-384.000.

Higaki, Masaru: *See*—
Miki, Atsushi; Mori, Etsunori; Hoshi, Minoru; and Higaki, Masaru, 4,571,570, Cl. 336-70.000.

Higginbotham, James M., Jr.; Varasso, Eugene C.; Rapp, Kenneth L.; and Sunkle, Thomas H., to Owens-Corning Fiberglas Corporation. Digital interface selector. 4,571,587, Cl. 340-825.530.

Higgins, George D.; and Wrona, James, to McCain Manufacturing Corporation. Stacking and strapping machine. 4,570,535, Cl. 100-7.000.

Higuchi, Takayoshi, to Kabushiki Kaisha Toshiba. Manufacturing a field oxide region for a semiconductor device. 4,570,325, Cl. 29-576.00W.

Hildebrand, James R.; and Sobanski, Kurt J., to United States of America, Air Force. Multiple thermocouple testing device. 4,571,689, Cl. 364-481.000.

Hill, Carl J., deceased: *See*—
Hill, William J.; Hill, Carl J., deceased; and Hill, Hazel R., executrix, 4,570,296, Cl. 17-11.000.

Hill, Hazel R., executrix: *See*—
Hill, William J.; Hill, Carl J., deceased; and Hill, Hazel R., executrix, 4,570,296, Cl. 17-11.000.

Hill, William J.; Hill, Carl J., deceased; and by Hill, Hazel R., executrix. Gizzard harvesting apparatus. 4,570,296, Cl. 17-11.000.

Hilti Aktiengesellschaft: *See*—
Uebel, Philipp; Rousek, Jaroslav; and Uhlig, Raimer, 4,570,401, Cl. 52-235.000.

Himmel, Robert L., to Gas Research Institute. Pulse combustion burner for cooking surface. 4,570,610, Cl. 126-39.00E.

Hindes, Charles S., to Humphrey Inc. Radius of curvature transducer. 4,570,354, Cl. 33-534.000.

Hinkel, Scott W.: *See*—
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.

Hinz, Carl H. Combined bird feed container and bird feeder. 4,570,575, Cl. 119-52.00R.

Hira, Takaaki: *See*—
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.

Hirai, Isamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. TTL Focus detecting device for single-lens reflex camera. 4,571,047, Cl. 354-403.000.

Hirano, Shigeo: *See*—
Harada, Toru; Hirano, Shigeo; Nakamura, Shigeru; and Shimamura, Isao, 4,571,376, Cl. 430-218.000.

Hirano, Yoshinori, to Nissan Motor Co., Ltd. Vapor cooled internal combustion engine coolant jacket. 4,570,579, Cl. 123-41.020.

Hirasaki, George J.: *See*—
Falls, Andrew H.; Lawson, Jimmie B.; and Hirasaki, George J., 4,570,711, Cl. 166-272.000.

Hirashiba, Yuji: *See*—
Kaneko, Kenichi; Hirashiba, Yuji; Kawai, Shinji; and Suzuki, Koichi, 4,570,274, Cl. 4-443.000.

Hirata, Kiminori: *See*—
Taniguchi, Masakazu; Baba, Masatoshi; Ochiai, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, 4,571,397, Cl. 514-252.000.

Hirayama, Mitsunori; and Yamanaka, Kimio, to Mitsubishi Denki Kabushiki Kaisha. Tracing system. 4,571,677, Cl. 364-200.000.

Hirayama, Tetsuro; Oikawa, Masayuki; and Horie, Ichirou, to Juki Co., Ltd. Overlock sewing machine having looping width adjusting mechanism. 4,570,558, Cl. 112-162.000.

Hirobe, Junichi: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.

Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, to Sumitomo Metal Industries, Ltd.; and Kurosaki Refractories Co., Ltd. Lining apparatus provided with a foldable spray pipe. 4,570,909, Cl. 266-281.000.

Hirose, Masayoshi: *See*—
Taniguchi, Masakazu; Baba, Masatoshi; Ochiai, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, 4,571,397, Cl. 514-252.000.

Hirose, Masayuki: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, 4,571,357, Cl. 428-153.000.

Hiroshi, Kato: *See*—
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Hitachi Construction Machinery Co., Ltd.: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.

Hitachi, Ltd.: *See*—
Azusawa, Noboru; and Shiraishi, Hisayoshi, 4,571,668, Cl. 363-81.000.
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.
Hatada, Minoru; Ishida, Hideaki; and Matsushita, Masatoshi, 4,571,672, Cl. 364-200.000.
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Ohkoshi, Tokio, 4,571,610, Cl. 357-67.000.
Miki, Atsushi; Mori, Etsunori; Hoshi, Minoru; and Higaki, Masaru, 4,571,570, Cl. 336-70.000.
Noda, Tsutomu; Iso, Yoshimi; and Sato, Tetsuo, 4,571,572, Cl. 340-347.0DA.
Ojima, Masahiro; Niihara, Toshio; and Fujiwara, Hideo, 4,571,650, Cl. 360-114.000.
Okayama, Tsutomu, 4,570,498, Cl. 73-720.000.
Tadauchi, Masaharu; Sato, Kunio; Tanno, Kiyohiko; Suehiro, Hiroshi; and Inoue, Yasuo, 4,571,573, Cl. 340-347.0AD.
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.

Hitachi Micro Computer Engineering Ltd.: *See*—
Hatada, Minoru; Ishida, Hideaki; and Matsushita, Masatoshi, 4,571,672, Cl. 364-200.000.

Hitachi Zosen Corporation: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.

Hitchcock, Louise M.: *See*—
Fishman, Bernard; Hitchcock, Louise M.; and O'Reilly, Kevin J., 4,571,386, Cl. 435-235.000.

Hobart Corporation: *See*—
Stockmeier, Glenn R.; and Treiber, Fritz F., 4,570,412, Cl. 53-167.000.

Hobson, Stephen R.: *See*—
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.

Hockemeyer, Friedrich; John, Peter; Muller, Johann; and Preiner, Gerhard, to Wacker-Chemie GmbH. Crosslinkable organopolysiloxanes and a method for preparing the same. 4,571,349, Cl. 427-54.100.

Hodgkinson, Alec J., to Z.S. Electroniques (Proprietary) Limited. Antenna matching device. 4,571,596, Cl. 343-860.000.

Hoechst Aktiengesellschaft: *See*—
Frensch, Heinz; Albrecht, Konrad; and Frisch, Gerhard, 4,571,088, Cl. 366-136.000.

Hoffmann, Dieter: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.

Hofstein, Steven R. Method of and apparatus for modifying a video signal to prevent the unauthorized recording and reproduction thereof. 4,571,642, Cl. 360-37.100.

Hogoboom, David R., to Cooper Industries, Inc. Reinforced hanging display package for window shade. 4,570,791, Cl. 206-326.000.

Hogue, John J. Water-cooled hub for flush-cut concrete saws. 4,570,609, Cl. 125-13.00R.

Hokanson, Allan E.: *See*—
Knox, Arthur C., Jr.; Hokanson, Allan E.; and Witsken, Anthony, 4,570,863, Cl. 241-33.000.

Holder, Ocie S. Vest type restraining garment. 4,571,000, Cl. 297-465.000.

Holik, Herbert; Hund, Helmut; and Mirsberger, Peter, to Escher Wyss Aktiengesellschaft. Press roll. 4,570,314, Cl. 29-113.00R.
Holland, Charlie R.; and DelPercio, Michael J., to Coin Acceptors, Inc. Article-dispensing assembly for a vending machine. 4,570,821, Cl. 221-194.000.
Hollister, F. Harold: *See—*
Diehl, Robert J.; Hollister, F. Harold; and Meyer, Danny S., 4,570,942, Cl. 277-12.000.
Hollmann, Dieter: *See—*
Konig, Karl-Heinz; Schuster, Michael; Hollmann, Dieter; and Schlodder, Rainer, 4,571,265, Cl. 75-108.000.
Holmstrom, Paul E.; and Ogrinc, Joseph F., to G. A. Gray Division, The Warner & Swasey Company. Spindle lock-up device. 4,570,313, Cl. 29-26.00A.
Holtgraver, Edward G., to Keystone International, Inc. Positioning assembly for use with rotatable valves. 4,570,901, Cl. 251-98.000.
Holz, Emil, to Hermann Finckh Maschinenfabrik GmbH & Co. Sorting screen. 4,571,298, Cl. 210-498.000.
Holze, Roland: *See—*
Erlebach, Gustav; Holze, Roland; and Koch, Gerhard, 4,571,115, Cl. 403-402.000.
Honda Giken Kogyo K.K.: *See—*
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,570,599, Cl. 123-489.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hara, Kunitaka, 4,570,740, Cl. 180-229.000.
Isono, Tokio, 4,570,963, Cl. 280-277.000.
Nishikawa, Masao; Sakai, Shinzo; and Aoki, Takashi, 4,570,770, Cl. 192-0.052.
Nishimura, Sadanori; and Maezono, Masakazu, 4,570,511, Cl. 74-867.000.
Nishimura, Sadanori, 4,570,764, Cl. 192-3.290.
Otobe, Yutaka, 4,570,592, Cl. 123-339.000.
Tsujii, Gen; and Yanagisawa, Takashi, 4,571,669, Cl. 363-144.000.
Uetsuji, Yonekazu; and Watanabe, Shoji, 4,570,584, Cl. 123-179.0SE.
Watanabe, Yoshimi; Tada, Yukio; Suzuki, Takanori; and Suzuki, Hitoshi, 4,570,587, Cl. 123-193.00P.
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Johnson, Robert G., 4,571,608, Cl. 357-28.000.
Jordan, Lavell, 4,571,548, Cl. 328-167.000.
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,570,329, Cl. 29-572.000.
Smith, Gary A., 4,570,448, Cl. 62-89.000.
Honeywell Information Systems Inc.: *See—*
Bourbeau, Arthur J., Jr.; and Doherty, John P., 4,571,072, Cl. 355-79.000.
Honeywell Information Systems Italia: *See—*
Mantellina, Calogero; Zanzottera, Daniele; and Gelmetti, Marco, 4,571,676, Cl. 364-200.000.
Hongu, Tatsuhiko: *See—*
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.
Honomichl, Larry L.: *See—*
Herzog, Alexander; Honomichl, Larry L.; Nagda, Jagdish M.; and Rehage, Teddy A., 4,571,699, Cl. 364-900.000.
Hooper, Clinton E.; and Silverman, Harold, to Pitney Bowes Inc. Conveying apparatus. 4,570,923, Cl. 271-275.000.
Hori, Takanobu: *See—*
Yamaguchi, Hiorji; Hori, Takanobu; and Hayashi, Masaharu, 4,570,771, Cl. 192-58.00B.
Hori, Toshio: *See—*
Fujiki, Yasuo; and Hori, Toshio, 4,571,561, Cl. 333-184.000.
Horiba, Ltd.: *See—*
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Horie, Ichirou: *See—*
Hirayama, Tetsuro; Oikawa, Masayuki; and Horie, Ichirou, 4,570,558, Cl. 112-162.000.
Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Radiation image read-out method. 4,571,493, Cl. 250-327.200.
Horiki, Akira: *See—*
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
Horikoshi, Yukio: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,570,316, Cl. 29-156.80R.
Horio, Motohiko; Kobayashi, Naoki; and Kaneko, Kouji, to Fuji Photo Optical Co., Ltd. Rotary shutter device. 4,571,629, Cl. 358-225.000.
Horiuchi, Tatsumi; Tamura, Takashi; and Kusuda, Tatufumi, to Konishiroku Photo Industry Co., Ltd. Recording apparatus. 4,571,063, Cl. 355-8.000.
Hornbeck, Larry J.; Nelson, William E.; and Carlo, James T., to Texas Instruments Incorporated. Deformable mirror electrostatic printer. 4,571,603, Cl. 346-160.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,571,248, Cl. 44-53.000.
Horst, Robert W.; and Harris, Richard L., to Tandem Computers Incorporated. Enhanced CPU microbranching architecture. 4,571,673, Cl. 364-200.000.
Horvath, Peter: *See—*
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Hoshi, Minoru: *See—*
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Hoshiba, Akihiko, to Sanshin Kogyo Kabushiki Kaisha. Intake silencer for marine propulsion device. 4,570,744, Cl. 181-204.000.
Hoshino Gakki Co., Ltd.: *See—*
Hoshino, Yoshihiro, 4,570,526, Cl. 84-413.000.
Hoshino, Shigeo, to Nissan Motor Co., Ltd. Semiconductor vibration detection device with lever structure. 4,571,661, Cl. 361-283.000.
Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Tensioning device for a drum head. 4,570,526, Cl. 84-413.000.
Houck, John C.; and Patt, Leonard M., to Endorphin, Inc. Immune stimulation. 4,571,336, Cl. 424-95.000.
Houdaille Industries, Inc.: *See—*
Shaw, Douglas N., 4,570,340, Cl. 30-123.000.
Household Manufacturing, Inc.: *See—*
Kingham, Paul E., 4,570,899, Cl. 251-51.000.
Houseman, David G.; and Binding, Gary J., to John Deks Australia Pty. Ltd. Sealing flashing for buildings with interlocking ring members. 4,570,943, Cl. 277-12.000.
Houston Geophysical Products, Inc.: *See—*
Annoot, Ira R., 4,571,018, Cl. 339-60.00R.
Howarth, Thomas T.; and Luk, King, to Beecham Group Limited. 6-Substituted derivatives of clavulanic acid. 4,571,392, Cl. 514-210.000.
Howell, Thomas D.: *See—*
Dolivo, Francois B.; Ungerboeck, Gottfried; and Howell, Thomas D., 4,571,734, Cl. 375-18.000.
Hsiao, Charles H.; and Kent, John S., to Syntex (U.S.A.) Inc. Controlled release naproxen and naproxen sodium tablets. 4,571,333, Cl. 424-22.000.
Hu, Cheng-Cheng: *See—*
Eaton, S. Sheffield, Jr.; and Hu, Cheng-Cheng, 4,570,331, Cl. 29-576.00B.
Huang, Lawrence K., to Qume Corporation. Selector for multibin sheet feeder. 4,570,919, Cl. 271-9.000.
Hubbard, Vance M.; and Brunson, Welton K., to Tecnol, Inc. Personal catheter leg strap. 4,571,245, Cl. 604-179.000.
Hubele, Heinz, to Pfaff Industriemaschinen GmbH. Stop motion device for sewing, embroidering or tufting machines. 4,570,560, Cl. 112-273.000.
Huenniger, Edward A.; and Byrns, Edson, to Carrier Corporation. Condenser purge probe. 4,570,455, Cl. 62-475.000.
Huertgen, Helmut B., to Sutton Engineering Company. Extrusion press. 4,570,473, Cl. 72-255.000.
Hugger, William: *See—*
Gmeiner, Gunter; Hugger, William; and Binder, Rudolf, 4,570,989, Cl. 296-97.000.
Hugh J. Baker and Company: *See—*
Armstrong, Donald R., 4,570,777, Cl. 192-134.000.
Hughes Aircraft Company: *See—*
Bohac, Frank J., Jr., 4,571,704, Cl. 355-156.000.
Hughes, Jerry J. Motorcycle backrest seat. 4,570,998, Cl. 297-353.000.
Huignard, Jean-Pierre: *See—*
Papuchon, Michel; Arditty, Herve ; Graindorge, Philippe; and Huignard, Jean-Pierre, 4,571,080, Cl. 356-345.000.
Humphrey Inc.: *See—*
Hindes, Charles S., 4,570,354, Cl. 33-534.000.
Hund, Helmut: *See—*
Holik, Herbert; Hund, Helmut; and Mirsberger, Peter, 4,570,314, Cl. 29-113.00R.
Hunt-Wesson Foods, Inc.: *See—*
Cage, James K.; Kolla, Shanti; and Gates, Jan E., 4,571,337, Cl. 426-107.000.
Hunter, Joe S.; and Little, Lawrence J., to United States of America, Army. Magnetic fluid gyro bearing and caging mechanism. 4,570,507, Cl. 74-5.120.
Hunter, Roy D. Combination handling and conveying apparatus. 4,571,145, Cl. 414-567.000.
Huot, Louis D.: *See—*
Waldo, Russell W.; Miller, Cardell E.; Huot, Louis D.; and Engstrom, George L., 4,570,985, Cl. 292-262.000.
Hurlbut, Donovan H.: *See—*
Ackerman, Richard; Hurlbut, Donovan H.; and Jewer, Alan A., 4,571,713, Cl. 369-44.000.
Husbands, Charles R., to United States of America, Air Force. Wavelength selective demultiplexer tuner. 4,571,024, Cl. 350-96.190.
Husmann, Horst, to Volkswagenwerk Aktiengesellschaft. Cage for a roller brake freewheel. 4,570,762, Cl. 188-82.840.
Huss, Charles P., to Minnesota Mining and Manufacturing Company. Apparatus for transferring images of conductive toner powder. 4,571,059, Cl. 355-3.0TR.
Hutt, Marland P.; Mich, Thomas F.; and Culbertson, Townley P., to Warner-Lambert Company. Antibacterial agents. 4,571,396, Cl. 514-249.000.
Hybrid Systems Corporation: *See—*
Collings, Jerry M., 4,571,507, Cl. 307-350.000.
Hydril Company: *See—*
Blose, Thomas L.; and Chelette, K. Darrel, 4,570,982, Cl. 285-334.000.
Burton, James A.; and Lee, Richard B., 4,570,977, Cl. 285-39.000.

Hyland, William J., to Mepco/Electra, Inc. Solid electrolyte capacitor for surface mounting. 4,571,664, Cl. 361-433.000.
Hymatic Engineering Company Limited, The: *See*—
Campbell, David N., 4,570,457, Cl. 62-514.0JT.
Hypeco AB: *See*—
Stenlund, Stig, 4,570,563, Cl. 114-140.000.
I.H.W. Engineering Ltd.: *See*—
Harrison, Neil, 4,570,999, Cl. 297-362.000.
Ideal Security Hardward Corporation: *See*—
Waldo, Russell W.; Miller, Cardell E.; Huot, Louis D.; and Engstrom, George L., 4,570,985, Cl. 292-262.000.
Ieki, Hideharu: *See*—
Kawabata, Akira; Shiosaki, Tadashi; Takeda, Fumio; Fujishima, Satoru; and Ieki, Hideharu, 4,571,519, Cl. 310-313.00A.
Igarashi, Toshiji: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.
Igel, Richard: *See*—
Furst, Arpad; and Igel, Richard, 4,570,992, Cl. 296-223.000.
Igel, Wolfgang, to Zinser Textilmaschinen GmbH. Device for gripping and holding a tube. 4,570,431, Cl. 57-275.000.
Ignatowicz, Alexander M., to AT&T Technologies, Inc. Methods of forming a screw terminal. 4,570,338, Cl. 29-845.000.
Iida, Atsuo: *See*—
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.
Iida, Hideo, to Kokoku Rubber Industrial Company Limited. Spring unit for a keyboard. 4,571,466, Cl. 200-5.00A.
Iida, Kazumi: *See*—
Nishimura, Kouzou; and Iida, Kazumi, 4,570,768, Cl. 192-35.000.
Iida, Tetsuya: *See*—
Iwamoto, Yoshihiro; and Iida, Tetsuya, 4,571,504, Cl. 307-290.000.
Iijima, Keiji: *See*—
Saito, Koetsu; Kawabuchi, Masami; Yamaguchi, Keisaku; and Iijima, Keiji, 4,571,520, Cl. 310-327.000.
Ikai, Tadayoshi: *See*—
Sakurai, Shigenori; Kamo, Takashi; and Ikai, Tadayoshi, 4,570,479, Cl. 73-116.000.
Ikemiya, Hiroyuki: *See*—
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.
Ikemoto, Kazuo: *See*—
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, 4,571,480, Cl. 219-146.300.
Ikuta, Yoshihisa: *See*—
Kimura, Shigeki; Ikuta, Yoshihisa; and Nakajima, Yoshihiro, 4,571,069, Cl. 355-14.00R.
Illinois Bell Telephone Company: *See*—
Armbruster, George E., 4,570,884, Cl. 248-68.100.
Illinois Tool Works Inc.: *See*—
Peek, Brian R., 4,571,136, Cl. 411-437.000.
Imai, Eiichi: *See*—
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Imamura, Haruo: *See*—
Akanuma, Shigetake; Takashima, Satoshi; Imamura, Haruo; and Ojiro, Yoshitaka, 4,571,002, Cl. 299-22.000.
Imperial Chemical Industries PLC: *See*—
Boulton, Thomas W., 4,571,288, Cl. 204-98.000.
Inaba, Akinobu: *See*—
Czech, John F.; Drucker, Irving M.; and Inaba, Akinobu, 4,570,892, Cl. 248-372.100.
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, to Fanuc Limited. Robot control system. 4,571,694, Cl. 364-513.000.
Inai, Yuichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.
Incom International Inc.: *See*—
Burk, Robert G., 4,571,229, Cl. 474-231.000.
Tracy, Wayne R., 4,571,228, Cl. 474-231.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Caneschi, Mario; and Tadini, Giorgio, 4,571,634, Cl. 358-261.000.
Ingersoll-Rand Company: *See*—
Hartshorn, Kevin, 4,570,666, Cl. 137-512.100.
McCoy, Gregory A., 4,570,741, Cl. 180-242.000.
Inmos Corporation: *See*—
Eaton, S. Sheffield, Jr.; and Hu, Cheng-Cheng, 4,570,331, Cl. 29-576.00B.
Eaton, Sargent S., Jr., 4,571,505, Cl. 307-297.000.
Innovative Electronic Designs, Inc.: *See*—
Martin, Hardison G.; and Ponto, Robert, 4,571,554, Cl. 330-252.000.
Inohara, Shizuo: *See*—
Iyehara, Sadahiro; Inohara, Shizuo; Masuda, Mitsuya; Ueda, Minoru; and Yamamoto, Keisuke, 4,571,614, Cl. 358-56.000.
Inoue, Ayumu: *See*—
Umemura, Takeaki; Inoue, Ayumu; and Mitsuda, Satoshi, 4,571,436, Cl. 568-354.000.
Inoue, Masayoshi: *See*—
Kaku, Takashi; Unagami, Shigeyuki; and Inoue, Masayoshi, 4,571,733, Cl. 375-13.000.
Inoue, Takashi, to Akebono Brake Industry Company Ltd. Cabling structure of parking cables for drum brakes. 4,570,761, Cl. 188-78.000.
Inoue, Takehisa: *See*—
Miwa, Kishio; Nagaoka, Yukiko; and Inoue, Takehisa, 4,571,441, Cl. 570-211.000.
Inoue, Yasuo: *See*—
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Inoue, Yutaka: *See*—
Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.
Inskeep, Eugene L., Jr. Method and apparatus for cleaning chemical/-water solutions. 4,571,301, Cl. 210-788.000.
Institut Francais du Petrole: *See*—
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,571,326, Cl. 422-207.000.
Cosyns, Jean; and Boitiaux, Jean-Paul, 4,571,442, Cl. 585-261.000.
Wittrisch, Christian, 4,570,709, Cl. 166-250.000.
Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR: *See*—
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.
Institut Organicheskoi Khimii Imeni N.D. Zelinskogo Akademii Nauk SSSR: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Instruments S.A.: *See*—
Thevenon, Alain, 4,571,074, Cl. 356-51.000.
Intel Corporation: *See*—
Skupnjak, Joseph A.; Lee, Douglas J.; and Becker, Neil J., 4,571,709, Cl. 365-233.000.
Interface Flooring Systems, Inc.: *See*—
Gable, Carl I., Jr., 4,571,353, Cl. 428-33.000.
International Business Machines Corporation: *See*—
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.
Chaitin, Gregory J., 4,571,678, Cl. 364-300.000.
Das, Subrata K.; Dixon, Norman R.; and Gluck, Robert F., 4,570,746, Cl. 181-242.000.
Dolivo, Francois B.; Ungerboeck, Gottfried; and Howell, Thomas D., 4,571,734, Cl. 375-18.000.
Emry, Carl A., Jr.; Neuman, Grover H.; Mersiovsky, Lynda K.; and Pfeuffer, Margaret S., 4,571,700, Cl. 364-900.000.
Hartung, Michael H., 4,571,674, Cl. 364-200.000.
Herzog, Alexander; Honomichl, Larry L.; Nagda, Jagdish M.; and Rehage, Teddy A., 4,571,699, Cl. 364-900.000.
Linsker, Ralph; and Rutter, Roger S., 4,571,451, Cl. 174-68.500.
Martin, William J., 4,571,527, Cl. 315-169.400.
Moksvold, Tor W., 4,571,275, Cl. 148-175.000.
International Coal Refining Company: *See*—
Derbidge, T. Craig; Mulholland, James A.; and Foster, Edward P., 4,570,551, Cl. 110-263.000.
International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,343, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,344, Cl. 426-535.000.
International Leisuretime Products, Inc.: *See*—
Kirby, Ronald S.; and Bergstrom, Richard J., 4,571,740, Cl. 455-344.000.
International Paper Company: *See*—
Hambleton, Thomas P.; and Triggiani, Richard R., 4,570,817, Cl. 220-345.000.
International Standard Electric Corporation: *See*—
Bingham, John; and Oliver, Allen W., 4,571,722, Cl. 370-106.000.
Lerouge, Claude P. H., 4,571,701, Cl. 364-757.000.
International Technology Services: *See*—
Schoenhard, James D., 4,571,120, Cl. 404-101.000.
Inuiya, Masafumi: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, 4,571,624, Cl. 358-212.000.
Inukai, Yuzo: *See*—
Naruse, Yasuhito; and Inukai, Yuzo, 4,571,316, Cl. 264-22.000.
Iomega Corporation: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,571,646, Cl. 360-99.000.
Ipco Corporation: *See*—
Weissman, Bernard, 4,571,187, Cl. 433-221.000.
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Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.
Irmscher, Edward; and Colodner, Jesse L. Ash container. 4,571,250, Cl. 55-359.000.
Isaka, Akihiko; and Saito, Takeo, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Drum in music box. 4,570,524, Cl. 84-96.000.
Isaka, Akihiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Ratchet mechanism. 4,570,769, Cl. 192-46.000.

Ishibashi, Kiyoshi; Ukai, Yujiro; Mita, Hideo; and Shiroshita, Yoshihira, to Aisin Seiki Kabushiki Kaisha. Method of absorbing thermal energy at low temperature. 4,570,445, Cl. 62-6.000.

Ishida, Hideaki: *See—*
Hatada, Minoru; Ishida, Hideaki; and Matsushita, Masatoshi, 4,571,672, Cl. 364-200.000.

Ishigo, Hideyasu: *See—*
Hattori, Motoichi; and Ishigo, Hideyasu, 4,571,457, Cl. 179-2.0EA.

Ishii, Akira: *See—*
Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, 4,571,006, Cl. 303-6.00C.

Ishii, Susumu, to Yoshida Kogyo K.K. Slide fastener slider with detachable pull tab. 4,570,309, Cl. 24-429.000.

Ishii, Takashi; Murata, Shinichi; Kusagawa, Shiro; and Wakasaki, Miyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thin metal band and a method for the manufacture of the same. 4,570,695, Cl. 164-463.000.

Ishikawa, Hiromi; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Hologram light deflector. 4,571,020, Cl. 350-3.710.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kuwano, Hiroaki, 4,570,472, Cl. 73-8.000.

Ishikura, Takashi; and Sakamoto, Hisakazu, to Tsubakimoto Chain Co. Conveying equipment. 4,570,543, Cl. 104-300.000.

Ishimoto, Zenichi, to Nikko Co., Ltd. Direction-converting device for a toy car. 4,571,213, Cl. 446-468.000.

Ishizuka, Yutaka: *See—*
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,571,164, Cl. 418-76.000.

ISO "Metalurgkomplekt": *See—*
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.

Iso, Yoshimi: *See—*
Noda, Tsutomu; Iso, Yoshimi; and Sato, Tetsuo, 4,571,572, Cl. 340-347.0DA.

Isobe, Masahiro; and Sugiura, Masashi, to Toyota Jidosha Kabushiki Kaisha. V-Belt stretching mechanism. 4,571,221, Cl. 474-101.000.

Isobe, Shinichi: *See—*
Fukuyama, Hiroomi; and Isobe, Shinichi, 4,571,687, Cl. 364-475.000.

Isobe, Toshiaki: *See—*
Kobayashi, Nobuyuki; Isobe, Toshiaki; Ohkawa, Nobuhisa; and Kuma, Takahide, 4,571,683, Cl. 364-431.050.

Isono, Tokio, to Honda Giken Kogyo Kabushiki Kaisha. Front wheel shock absorbing system for motorcycles. 4,570,963, Cl. 280-277.000.

Isono, Yoshiya: *See—*
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, 4,571,285, Cl. 204-1.00T.

Isshiki, Masanori: *See—*
Suzuki, Toshiyuki; and Isshiki, Masanori, 4,571,653, Cl. 360-125.000.

Isshiki, Minoru: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Itakura, Keiichi, to Genentech, Inc. Mammalian gene for microbial expression. 4,571,421, Cl. 536-27.000.

Ito, Kaoru, to Kabushiki Kaisha Sato. Web feed mechanism for feeding a web from a roll. 4,570,870, Cl. 242-75.400.

Ito, Kenzo: *See—*
Takanabe, Kazunori; Yamamoto, Masaki; Ito, Kenzo; and Fujinami, Hiroshi, 4,571,684, Cl. 364-449.000.

Ito, Kunio: *See—*
Tarumi, Noriyoshi; Fukuchi, Masakazu; and Ito, Kunio, 4,571,068, Cl. 355-14.00D.

Ito, Masaki; and Yamazoe, Hiroshi, to Nippondenso Co., Ltd. Fuel delivery pipe. 4,570,601, Cl. 123-468.000.

Ito, Shizuo: *See—*
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.

Ito, Yujiro, to Kowa Automobile Industrial Co, Ltd. Truck with automatic ground softening apparatus. 4,570,553, Cl. 111-6.000.

Itoh, Satoru, to Fuji Xerox Co., Ltd. Device for reading images of both surfaces of an original in one pass. 4,571,636, Cl. 358-285.000.

ITT Industries, Inc.: *See—*
Schmidt, Herbert, 4,570,760, Cl. 188-73.440.

Ives, Milton N.: *See—*
Sorenson, Richard W.; and Ives, Milton N., 4,571,467, Cl. 200-6.0BA.

Ivey, H. Grady: *See—*
Strickland, James K.; and Ivey, H. Grady, 4,570,896, Cl. 249-27.000.

Iwahashi, Hiroshi; and Ariizumi, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,571,706, Cl. 365-200.000.

Iwai, Yoshiyuki: *See—*
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.

Iwamoto, Yoshihiro; and Iida, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Schmitt trigger circuit with selection circuit. 4,571,504, Cl. 307-290.000.

Iwao, Noriyuki: *See—*
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.

Iwashita, Takashi; Suzuki, Hideo; and Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Detent mechanism for clutches. 4,570,776, Cl. 192-114.00R.

Iwata, Hiroshi: *See—*
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.

Iwatsuki, Keiji: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, 4,571,338, Cl. 426-324.000.

Iwaya Corporation: *See—*
Saigo, Hiroshi; and Nagamori, Kazuo, 4,571,208, Cl. 446-353.000.

IXI Laboratories, Inc.: *See—*
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., 4,571,645, Cl. 360-98.000.

Iyehara, Sadahiro; Inohara, Shizuo; Masuda, Mitsuya; Ueda, Minoru; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Color image display apparatus. 4,571,614, Cl. 358-56.000.

Iyer, Subramaniam S.: *See—*
Agrawal, Jagannath P.; and Iyer, Subramaniam S., 4,571,736, Cl. 375-27.000.

Izumi, Asashiro; and Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Dispersing feeder. 4,570,831, Cl. 272-199.000.

Izzo, Henry J.; and McNaught, John P., to Lever Brothers Company. Edible composition comprising discrete fat-bearing particles in a fat-bearing matrix. 4,571,347, Cl. 426-581.000.

J. C. Pardo and Sons: *See—*
Pardo, Warren A.; Pardo, Richard J.; and Gabriele, Valentino, 4,571,091, Cl. 366-311.000.

Jackson, Francis W. Multiple piston expansion chamber engine. 4,570,580, Cl. 123-52.00B.

Jaggy, Hermann E. W.: *See—*
Chatterjee, Shyam S.; Gabard, Bernard L.; and Jaggy, Hermann E. W., 4,571,407, Cl. 514-464.000.

Jako, Geza J. Binocular zoom microscope. 4,571,038, Cl. 350-515.000.

James, George W.: *See—*
Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., 4,571,724, Cl. 371-25.000.

Janome Sewing Machine Industry Co., Ltd.: *See—*
Makabe, Hachiro; and Kongoh, Takeshi, 4,570,561, Cl. 112-454.000.

Janssen, Daniel J. G., to U.S. Philips Corporation. Multiple use digital tone generator in telephone. 4,571,462, Cl. 179-84.00T.

Japan Metals and Chemicals Co., Ltd.: *See—*
Matsubara, Yutaka; Konno, Hisao; and Sasai, Takashi, 4,570,446, Cl. 62-48.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Arai, Kozo, 4,571,542, Cl. 324-158.00P.

Japan Tobacco & Salt Public Corporation, The: *See—*
Muto, Yoshiyuki; and Etani, Tadao, 4,571,011, Cl. 308-3.500.

Jarvinen, Marja-Leena: *See—*
Sipila, Heikki J.; and Jarvinen, Marja-Leena, 4,571,196, Cl. 445-53.000.

Jarzombek, Richard E.; and Moeller, Raymond J., to Bee Chemical Co. Liquid colorant/additive concentrate for plastics. 4,571,416, Cl. 524-474.000.

Jaskolski, Stanley V.: *See—*
Benjamin, James A.; Lade, Robert W.; Schutten, Herman P.; and Jaskolski, Stanley V., 4,571,606, Cl. 357-23.400.

Jaster, Dale R., to GTE Automatic Electric Incorporated. Photovoltaic power regulation system. 4,571,532, Cl. 320-2.000.

Jeans, Edward L., to Cadbury Schweppes, PLC. Gravity dispenser. 4,570,830, Cl. 222-185.000.

Jenkins, Jerold D. Bladder pump. 4,571,297, Cl. 210-101.000.

Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Ventilating skylight. 4,570,394, Cl. 52-72.000.

Jewer, Alan A.: *See—*
Ackerman, Richard; Hurlbut, Donovan H.; and Jewer, Alan A., 4,571,713, Cl. 369-44.000.

Jewett, Warren R.: *See—*
Raymond, Leonard S.; and Jewett, Warren R., 4,571,543, Cl. 324-425.000.

Johansson, Eric B.; and Matzner, Bruce, to General Electric Company. Nuclear fuel assembly spacer. 4,571,324, Cl. 376-441.000.

Johansson, Leif; Petersson, Stig A.; and Rudling, Bengt O., to Boliden Aktiebolag. Method for recovering the metal values from materials containing tin and/or zinc. 4,571,260, Cl. 75-21.000.

John Deks Australia Pty. Ltd: *See—*
Houseman, David G.; and Binding, Gary J., 4,570,943, Cl. 277-12.000.

John, Peter: *See—*
Hockemeyer, Friedrich; John, Peter; Muller, Johann; and Preiner, Gerhard, 4,571,349, Cl. 427-54.100.

Johnson, Bernard L., to Universal Building Systems, Inc. Connector apparatus for modular panel structure. 4,570,402, Cl. 52-241.000.

Johnson, Bruce G.: *See—*
Johnson, Louis W.; and Johnson, Bruce G., 4,571,112, Cl. 403-320.000.

Johnson, Charles D. Valve. 4,570,670, Cl. 137-553.000.

Johnson, Curtis A.: *See—*
Renlund, Gary M.; and Johnson, Curtis A., 4,571,414, Cl. 524-322.000.
Johnson, David E.; Abersold, Larry A.; and McCall, Kenneth E., to Air Products and Chemicals, Inc. Electrode drive and nozzle system for an automatic air carbon-arc cutting and gouging torch. 4,571,478, Cl. 219-69.00R.
Johnson, Louis W.; and Johnson, Bruce G. Joint assembly. 4,571,112, Cl. 403-320.000.
Johnson, Marie, administratrix: *See—*
Johnson, Paul, deceased; and Johnson, Marie, administratrix, 4,571,117, Cl. 404-77.000.
Johnson, Paul, deceased; and by Johnson, Marie, administratrix. Method and apparatus for forming an ice road over snow-covered terrain. 4,571,117, Cl. 404-77.000.
Johnson, Richard H.: *See—*
Larson, Spencer B.; Johnson, Richard H.; Hennemann, Thomas L., Jr.; and Copeland, James L., 4,571,327, Cl. 422-263.000.
Johnson, Robert G., to Honeywell Inc. Integrated voltage-isolation power supply. 4,571,608, Cl. 357-28.000.
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., to IXI Laboratories, Inc. Horizontal flexible disk loading and sorting/collating mechanism. 4,571,645, Cl. 360-98.000.
Johnson, Roy V.: *See—*
Lindenberger, James N.; Christie, Bert M.; and Johnson, Roy V., 4,571,449, Cl. 174-35.0MS.
Johnson, William M., to Charles Stark Draper Laboratory, The. Blooming auto collimator. 4,571,076, Cl. 356-152.000.
Johnston, Taylor C. Spraying apparatus. 4,570,855, Cl. 239-195.000.
Jonasson, Staffan M. O., to Frigoscandia Contracting AB. Removing frost deposits from cooling-coil batteries in a freezing plant during operation. 4,570,447, Cl. 62-80.000.
Jones, Donald W., to General Electric Company. Method of making a permanent magnet rotor. 4,570,333, Cl. 29-598.000.
Jones, Ed F. Pre-pressurized accumulator for hydraulic brake system. 4,571,009, Cl. 303-87.000.
Jones, James F.; and Prufer, George O. Roadway patching attachment for dump trucks. 4,571,119, Cl. 404-96.000.
Jones, Ronald D.: *See—*
Morita, Richard Y.; and Jones, Ronald D., 4,571,384, Cl. 435-167.000.
Jonsson, Nils I.; and Hedenstierna, Lars E., to EMA Instrument AB. Venting device for oil-burning installations. 4,570,664, Cl. 137-202.000.
Jordan, Arthur D., Jr., to Rohm and Haas Company. Washout resistant coatings. 4,571,415, Cl. 524-428.000.
Jordan, Lavell, to Honeywell Inc. Floating limiter circuit. 4,571,548, Cl. 328-167.000.
Joseph E. Seagram & Sons, Inc.: *See—*
Boucher, Armand, 4,570,534, Cl. 99-277.000.
Josephs, Mark A.: *See—*
Gallaro, Anthony V.; and Josephs, Mark A., 4,571,521, Cl. 313-402.000.
Jouan, Antoine: *See—*
Bonniaud, Roger; Jouan, Antoine; and Hery, Yves, 4,571,307, Cl. 252-628.000.
Joustra S.A.: *See—*
Diebold, Camille, 4,571,202, Cl. 446-90.000.
Joy Manufacturing Company: *See—*
Diehl, Robert J.; Hollister, F. Harold; and Meyer, Danny S., 4,570,942, Cl. 277-12.000.
Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., 4,571,330, Cl. 423-242.000.
Juki Co., Ltd.: *See—*
Hirayama, Tetsuro; Oikawa, Masayuki; and Horie, Ichirou, 4,570,558, Cl. 112-162.000.
Jung Corporation: *See—*
Gamm, Paul B., 4,570,619, Cl. 128-78.000.
Jung, Herbert: *See—*
Kunstle, Gerhard; and Jung, Herbert, 4,571,433, Cl. 564-4.000.
Jung, Werner; and Purzycki, Alfred Z., to AT&T Teletype Corporation. Retractable pin sprocket wheel assembly. 4,571,104, Cl. 400-616.300.
Junichi Nishizawa: *See—*
Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, 4,571,624, Cl. 358-212.000.
Junkosha Company Ltd.: *See—*
Sugibuchi, Hiroyuki, 4,570,477, Cl. 73-40.50R.
Jurov, Boyan M.: *See—*
Nikolov, Valentin A.; Klissurski, Dimiter G.; and Jurov, Boyan M., 4,571,325, Cl. 422-191.000.
Justice, Raymond, to Cubic Corporation. Skin effect antennas. 4,571,592, Cl. 343-767.000.
K-Patents Oy: *See—*
Kamrat, Esko, 4,571,075, Cl. 356-136.000.
Kabelmetal Electro GmbH: *See—*
Schippl, Klaus, 4,570,679, Cl. 138-149.000.
Ziemek, Gerhard; and Schippl, Klausdieter, 4,570,678, Cl. 138-113.000.
Kabushiki Kaisha Audio-Technica: *See—*
Reichel, Kenneth; Nichols, Frederick W., III; and Levenstein, Norm, 4,571,717, Cl. 369-256.000.
Kabushiki Kaisha Bandai: *See—*
Murakami, Katsushi, 4,571,199, Cl. 446-73.000.
Murakami, Katsushi, 4,571,203, Cl. 446-95.000.
Kabushiki Kaisha Chiyoda: *See—*
Okubo, Keigo; Toba, Shoji; and Kumagai, Tokuo, 4,571,287, Cl. 204-37.600.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Izumi, Asashiro; and Fukuda, Masao, 4,570,831, Cl. 222-199.000.
Ueda, Kenji, 4,570,727, Cl. 177-25.000.
Kabushiki Kaisha Kibun: *See—*
Goto, Shobun; Sugihara, Jiro; and Yabusaki, Masayoshi, 4,571,167, Cl. 425-289.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Mori, Takasuke; Miyazaki, Jun; and Nakata, Hitoshi, 4,570,697, Cl. 164-484.000.
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, 4,571,480, Cl. 219-146.300.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Akanuma, Shigetake; Takashima, Satoshi; Imamura, Haruo; and Ojiro, Yoshitaka, 4,571,002, Cl. 299-22.000.
Mizoguchi, Hakaru; Egawa, Akira; and Okamoto, Akira, 4,571,730, Cl. 372-58.000.
Yoshida, Kazuhiro; and Murakami, Takashi, 4,570,441, Cl. 60-421.000.
Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho: *See—*
Takagi, Shigeki; and Urayama, Yumiko, 4,571,256, Cl. 71-28.000.
Kabushiki Kaisha Okuma Tekkosho: *See—*
Torisawa, Yoshio, 4,571,686, Cl. 364-474.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Isaka, Akihiko; and Saito, Takeo, 4,570,524, Cl. 84-96.000.
Isaka, Akihiko, 4,570,769, Cl. 192-46.000.
Kabushiki Kaisha Sato: *See—*
Ito, Kaoru, 4,570,870, Cl. 242-75.400.
Kabushiki Kaisha Suwa Seikosha: *See—*
Ono, Toshiaki; and Kusabuka, Yoshito, 4,571,102, Cl. 400-248.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Hanaki, Akira, 4,571,469, Cl. 200-61.540.
Kawaguchi, Teruhiko; and Nishimura, Yuji, 4,570,975, Cl. 280-806.000.
Kabushiki Kaisha Toshiba: *See—*
Higuchi, Takayoshi, 4,570,325, Cl. 29-576.00W.
Kahelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Moritz, Werner, 4,570,437, Cl. 59-78.100.
Kakizaki, Katsumi, to Tomy Company, Incorporated. Spark emitting fly wheel driven vehicle. 4,571,212, Cl. 446-462.000.
Kaku, Takashi; Unagami, Shigeyuki; and Inoue, Masayoshi, to Fujitsu Limited. Automatic equalization device and method of starting-up the same. 4,571,733, Cl. 375-13.000.
Kali und Salz AG: *See—*
Zentgraf, Helmut; and Fricke, Gunter, 4,570,861, Cl. 241-24.000.
Kalica, Anthony R.: *See—*
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.
Kaltenbach & Voigt GmbH & Co.: *See—*
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.
Beier, Stefan; and Gmeinder, Hermann, 4,571,681, Cl. 364-413.000.
Kamburg, Roman A.: *See—*
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Kamijo, Ken: *See—*
Tsujimura, Harutoshi; and Kamijo, Ken, 4,570,872, Cl. 242-107.000.
Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; and Kaminski, Joan M., 4,571,248, Cl. 44-53.000.
Kamio, Akio: *See—*
Mitsumatsu, Yoshio; Kamio, Akio; Seike, Shoji; and Nozaki, Masayuki, 4,571,660, Cl. 361-127.000.
Kamio, Hiroshi; Ueno, Yasushi; Noguchi, Takao; Kunioka, Kazuo; and Fukuda, Shuzo, to Nippon Kokan Kabushiki Kaisha. Apparatus for continuously cooling heated metal plate. 4,570,453, Cl. 62-375.000.
Kamleitner, Ewald: *See—*
Deutschmann, Herbert; Haussmann, Gerhard; and Kamleitner, Ewald, 4,570,442, Cl. 60-612.000.
Kamo, Takashi: *See—*
Sakurai, Shigenori; Kamo, Takashi; and Ikai, Tadayoshi, 4,570,479, Cl. 73-116.000.
Kamoshida, Mototaka, to NEC Corporation. Production system for manufacturing semiconductor devices. 4,571,685, Cl. 364-468.000.
Kamrat, Esko, to K-Patents Oy. Measuring window for a process refractometer. 4,571,075, Cl. 356-136.000.
Kan, Fumitaka: *See—*
Urawa, Motoo; Takenouchi, Masanori; Kan, Fumitaka; Suematsu, Kohshi; and Imai, Eiichi, 4,571,372, Cl. 430-122.000.
Kanazawa, Yuzo: *See—*
Tanizaki, Hiroyuki; Sato, Kazuma; Munakata, Kiyohiko; and Kanazawa, Yuzo, 4,570,997, Cl. 297-349.000.
Kane, Lawrence M.; and Revane, James E., to Daig Corporation. Endocardial extendable screw-in lead. 4,570,642, Cl. 128-785.000.
Kane, Noel S.; Robbins, Jack L.; and Coops, Melvin S. Method to detect, identify, authenticate and date an article. 4,571,492, Cl. 250-303.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Kaneko, Kenichi; Hirashiba, Yuji; Kawai, Shinji; and Suzuki, Koichi, to Aisin Seiki Kabushiki Kaisha. Device for washing posterior parts of human body. 4,570,274, Cl. 4-443.000.

Kaneko, Kouji: *See*—
Horio, Motohiko; Kobayashi, Naoki; and Kaneko, Kouji, 4,571,629, Cl. 358-225.000.

Kanzaka, Yoshihiro, to Nippon Notion Kogyo Co., Ltd. Button having plate for deflecting an attaching tack. 4,570,307, Cl. 24-95.000.

Kapa, Prasad K., to Sandoz, Inc. 6-Substituted-4-hydroxy-tetrahydropyran-2-ones. 4,571,428, Cl. 556-437.000.

Kapikian, Albert Z.: *See*—
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.

Kaplan, Stanley. Flip toggle anchoring device. 4,570,891, Cl. 248-341.000.

Kappenhagen, George A., to Westinghouse Electric Corp. Escalator. 4,570,781, Cl. 198-333.000.

Karada, Hiroshi: *See*—
Takada, Yukimitsu; and Karada, Hiroshi, 4,571,193, Cl. 440-77.000.

Karagounis, Vasilios A.: *See*—
Liu, Chung-Chiun; and Karagounis, Vasilios A., 4,571,292, Cl. 204-412.000.

Karas, Nicholas V., to United States of America, Air Force. Intrusion barrier and detection apparatus. 4,571,578, Cl. 340-541.000.

Karavaev, Andron T.: *See*—
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Roth, Josef, 4,570,462, Cl. 66-204.000.

Karl Schaeff GmbH & Co. Maschinenfabrik: *See*—
Schaeff, Hans, 4,571,147, Cl. 414-694.000.

Karpov, Anatoly M.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Karr, Michael A., Jr., to Gray Tool Company. Fire resistant valve. 4,570,659, Cl. 137-72.000.

Kartridg Pak Co., The: *See*—
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,570,278, Cl. 15-97.00R.

Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, to Canon Kabushiki Kaisha. Image forming apparatus. 4,571,053, Cl. 355-3.00R.

Kashihara, Tomio; and Aoyagi, Katsuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Wire bonding apparatus. 4,571,688, Cl. 364-477.000.

Kashiwagi, Shunji, to Fujitsu Limited. Semiconductor chip with a metal heat radiator. 4,571,611, Cl. 357-81.000.

Kashyap, Satish C.: *See*—
Wyslouzil, Walter; and Kashyap, Satish C., 4,571,473, Cl. 219-10.55A.

Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,570,288, Cl. 16-35.00R.

Kassai, Kenzou, to Kassai Kabushikikaisha. Spring supported caster having a disengageable swivel lock. 4,570,288, Cl. 16-35.00R.

Kastrup, Eberhard: *See*—
Reinke, Kurt; Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, 4,570,555, Cl. 112-67.000.

Kasuga, Akira; Matsufuji, Akihiro; Yamada, Yasuyuki; and Tsuji, Nobuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,571,364, Cl. 428-336.000.

Kato, Akira: *See*—
Minamida, Hisatsugu; Kato, Akira; Sawayama, Isamu; and Tanaka, Ken-ichi, 4,571,412, Cl. 524-64.000.

Kato Hatsujo Kaisha, Ltd.: *See*—
Ohkata, Ichizo, 4,570,852, Cl. 236-93.00R.

Kato, Kikuji; Watabe, Akinori; Ukita, Hiroo; and Yonezawa, Susumu, to Nippon Telegraph & Telephone Public Corporation. Optical head movable in a tracking direction. 4,571,715, Cl. 369-45.000.

Kato, Masatake, to Canon Kabushiki Kaisha. Wide angle zoom objective. 4,571,031, Cl. 350-426.000.

Kato, Masatake; Kitagishi, Nozomu; and Hattori, Jun, to Canon Kabushiki Kaisha. Zoom lens. 4,571,033, Cl. 350-427.000.

Kato, Mitsumi: *See*—
Futamase, Tsuyoshi; and Kato, Mitsumi, 4,570,523, Cl. 84-1.240.

Kato, Tadaharu: *See*—
Nishitani, Takao; Kuroda, Ichiro; and Kato, Tadaharu, 4,571,737, Cl. 375-27.000.

Kato, Yasuyoshi; Konishi, Kunihiko; and Ohta, Masao, to Babcock-Hitachi Kabushiki Kaisha. Ammonia reduction-denitration process and apparatus therefor. 4,571,329, Cl. 423-239.000.

Katoh, Kazutaka: *See*—
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.

Katz, Saul N.; and Vogel, Gerald J., to General Foods Corporation. Process for efficiently concentrating an aroma stream. 4,571,339, Cl. 426-387.000.

Kaufman, Jay S.: *See*—
Ringsmuth, Richard J.; and Kaufman, Jay S., 4,570,703, Cl. 165-162.000.

Kaufman, Jeanie F.: *See*—
Kaufman, Martin H.; Cerceo, Chris A.; and Kaufman, Jeanie F., 4,570,282, Cl. 15-167.00R.

Kaufman, Martin H.; Cerceo, Chris A.; and Kaufman, Jeanie F. Toothbrush. 4,570,282, Cl. 15-167.00R.

Kaverina, Natalya V.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Kawabata, Akira; Shiosaki, Tadashi; Takeda, Fumio; Fujishima, Satoru; and Ieki, Hideharu, to Murata Manufacturing Co., Ltd. Sezawa surface acoustic wave device using a piezoelectric layer over a nitride layer on a substrate. 4,571,519, Cl. 310-313.00A.

Kawabe, Kenji: *See*—
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.

Kawabuchi, Masami: *See*—
Saito, Koetsu; Kawabuchi, Masami; Yamaguchi, Keisaku; and Iijima, Keiji, 4,571,520, Cl. 310-327.000.

Kawada, Masashi: *See*—
Watanabe, Kozo; Kawada, Masashi; and Okada, Yozo, 4,570,422, Cl. 53-557.000.

Kawaguchi, Hideo; Okita, Tsutomu; and Tamaki, Hiroyuki, to Fuji Photo Film Co., Ltd. Antistatic plastic films. 4,571,361, Cl. 428-328.000.

Kawaguchi, Shojiro; and Odaka, Kuniyuki, to Matsushita Electric Works, Ltd. Toilet bowl flushing device. 4,570,272, Cl. 4-302.000.

Kawaguchi, Teruhiko; and Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing locking device. 4,570,975, Cl. 280-806.000.

Kawai, Hisasi: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; and Saito, Tsutomu, 4,570,594, Cl. 123-414.000.

Kawai Musical Instruments Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,570,520, Cl. 84-1.010.

Kawai, Noriaki: *See*—
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.

Kawai, Shinji: *See*—
Kaneko, Kenichi; Hirashiba, Yuji; Kawai, Shinji; and Suzuki, Koichi, 4,570,274, Cl. 4-443.000.

Kawai, Taiyo; Nakagawa, Norihisa; Kayanuma, Nobuaki; and Nagai, Toshinari, to Toyota Jidosha Kabushiki Kaisha. Internal combustion engine with multiple intake valves. 4,570,590, Cl. 123-308.000.

Kawai, Takayoshi: *See*—
Takemi, Akio; Yoshimi, Akiro; and Kawai, Takayoshi, 4,570,450, Cl. 62-199.000.

Kawaishi, Yasunori: *See*—
Tani, Tatsuo; and Kawaishi, Yasunori, 4,571,056, Cl. 355-3.0FU.

Kawamura, Miichiro; and Fujihashi, Mitsuru, to Carl Freudenberg, Firma. Method for manufacturing water soluble fabric for chemical laces. 4,570,311, Cl. 28-164.000.

Kawano, Tatsuo: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.

Kawarabashi, Tsukasa; and Takahashi, Shinji, to Murata Kikai Kabushiki Kaisha. Cop supplying device. 4,570,865, Cl. 242-35.50A.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Uchinishi, Eizaburo, 4,570,439, Cl. 60-314.000.

Kawasaki, Kunio: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.

Kawasaki Steel Corporation: *See*—
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.

Kawase, Hisao: *See*—
Yamada, Toshiro; Sakai, Noriyasu; and Kawase, Hisao, 4,571,367, Cl. 428-653.000.

Kawaura, Masafumi: *See*—
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.

Kayama, Hiroaki: *See*—
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,570,506, Cl. 74-501.50R.

Kayanuma, Nobuaki: *See*—
Kawai, Taiyo; Nakagawa, Norihisa; Kayanuma, Nobuaki; and Nagai, Toshinari, 4,570,590, Cl. 123-308.000.

Kaye, Peter D., to Bell Industries, Inc. Mechanically programmable-sequencing valve. 4,570,674, Cl. 137-624.180.

Kazami, Kazuyuki, to Nippon Kogaku K.K. Display device of a camera. 4,571,051, Cl. 354-468.000.

Kazecki, Henry L.: *See*—
Phillips, James P.; and Kazecki, Henry L., 4,571,595, Cl. 343-745.000.

Kazusa, Susumu; Okamoto, Harunori; and Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Bicycle tire tread. 4,570,689, Cl. 152-209.00R.

Keen, Brian T.; and Robson, John H., to Union Carbide Corporation. Continuous process for the production of alkylene glycol in the presence of organometalate. 4,571,440, Cl. 568-872.000.

Kelch, Eugene W.: *See*—
Niewald, Jack L.; and Kelch, Eugene W., 4,571,142, Cl. 414-427.000.

Keller, Herbert, to Kraftwerk Union Aktiengesellschaft. Axial-admission steam turbine, especially of double-flow construction. 4,571,153, Cl. 415-117.000.

Keller, Michael: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,571,665, Cl. 362-225.000.

Kelz, Rony: *See*—
Fritz, Ulrich; and Kelz, Rony, 4,570,789, Cl. 206-83.500.

Kendall-Tobias, Michael W., to Perkin-Elmer Corporation, The. System for changing oxidants in a flame atomic absorption spectrophotometer. 4,571,172, Cl. 431-62.000.

Kendrick, William D.; and Mayfield, Terry D., to Halliburton Company. Fluid flow delivery system. 4,570,673, Cl. 137-615.000.

Kennedy, Dan J.: *See*—
White, James T., Sr.; and Kennedy, Dan J., 4,571,356, Cl. 428-143.000.

Kennon, Jerry M., to Westinghouse Electric Corp. Watt-hour meter with fiber optics tamper detector. 4,571,691, Cl. 364-483.000.

Kent, John S.: *See*—
Hsiao, Charles H.; and Kent, John S., 4,571,333, Cl. 424-22.000.

Keogh, Kenneth D., to Southco, Inc. Knob-to-shaft assembly. 4,571,111, Cl. 403-282.000.

Kerfoot, Derek G. E.; Kofluk, Russell P.; and Weir, Donald R., to Sherritt Gordon Mines Limited. Recovery of platinum group metals from nickel-copper-iron matte. 4,571,262, Cl. 75-101.00R.

Kerney, Robert A.; and Hardy, Alfred E. Brake shoe resizer. 4,570,475, Cl. 72-412.000.

Kerschner, Engelbert; and Muschelknautz, Edgar, to Walter Schneider GmbH & Co. KG. Method of and apparatus for picking up refuse from a surface, such as a track bed. 4,570,287, Cl. 15-346.000.

Keystone International, Inc.: *See*—
Holtgraver, Edward G., 4,570,901, Cl. 251-98.000.

Keyworth, Donald A., to Tenneco Oil Company. Method for controlled oligomerization/etherification of propylene. 4,571,439, Cl. 568-697.000.

Khmelnitsky, Lenor I.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Kiess, Peter: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.

Kijowski, John; and Miller, Gregory D., to Pittsburgh Corning Corporation. Method and apparatus for leveling a batch of pulverulent constituents in making a vitreous cellular material. 4,571,321, Cl. 264-43.000.

Kikuchi, Juro: *See*—
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.

Kikuchi, Tetsuro: *See*—
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.

Kile, Walter F. Tool for aligning engine cylinder heads. 4,570,320, Cl. 29-271.000.

Kimberly-Clark Corporation: *See*—
Burmeister, Harland A.; and Weinig, Lee A., 4,570,518, Cl. 83-504.000.

Kimura, Shigeki; Ikuta, Yoshihisa; and Nakajima, Yoshihiro, to Mita Industrial Company Limited. Recording apparatus. 4,571,069, Cl. 355-14.00R.

Kimura, Tadakatsu; Makabe, Takayoshi; and Kuraishi, Yoshiaki, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Full wave rectifier having an operational amplifier. 4,571,502, Cl. 307-262.000.

Kimura, Tadashi: *See*—
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.

King, Patrick D., to Flo-Con Systems, Inc. Furnace valve. 4,570,908, Cl. 266-236.000.

King, Robert D.; and Henderson, James M., to Mead Corporation, The. Diaphragm pump having a flat plate actuating member slidable in slots. 4,571,160, Cl. 417-437.000.

Kingham, Paul E., to Household Manufacturing, Inc. Adjustable slow closing valve assembly. 4,570,899, Cl. 251-51.000.

Kintz, Lawrence J., Jr.; and Blain, Edward S., to Sundstrand Corporation. Temperature sensor pocket for dynamoelectric machine winding. 4,571,518, Cl. 310-68.00R.

Kioritz Corporation: *See*—
Take, Tokio; Sonoda, Satoshi; and Yamamoto, Takayuki, 4,570,593, Cl. 123-398.000.

Kirby, Ronald S.; and Bergstrom, Richard J., to International Leisuretime Products, Inc. Recreation apparatus. 4,571,740, Cl. 455-344.000.

Kircaldie, Randall and McNab (As Trustee): *See*—
Durkan, Gerald, 4,570,631, Cl. 128-204.230.

Kirchner, Edward C., to Beloit Corporation. Flexible disk refiner and method. 4,570,862, Cl. 241-28.000.

Kirilov, Kosta Y.: *See*—
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.

Kirkpatrick, Paul A.: *See*—
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.

Kish, Jules G., to United Technologies Corporation. Overunning clutch spring. 4,570,318, Cl. 29-173.000.

Kishi, Hajimu; and Tanaka, Kunio, to Fanuc Ltd. NC Programming Apparatus. 4,571,670, Cl. 364-171.000.

Kishi, Noriyuki: *See*—
Hasegawa, Shumpei; and Kishi, Noriyuki, 4,570,599, Cl. 123-489.000.

Kishimoto, Yasuo: *See*—
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.

Kiss, James M.; and Perrone, Mathew R. P., Jr. Collapsible and floatable beverage holder. 4,571,194, Cl. 441-1.000.

Kitagishi, Nozomu: *See*—
Kato, Masatake; Kitagishi, Nozomu; and Hattori, Jun, 4,571,033, Cl. 350-427.000.

Kitahara, Kenichi: *See*—
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.

Kitamura, Nobuo: *See*—
Tamaru, Hideshi; Shikakura, Kunio; Kitamura, Nobuo; Yoshida, Kimiyoshi; and Sakano, Akio, 4,571,454, Cl. 178-18.000.

Kiuchi, Takao: *See*—
Nakayama, Yoshiaki; and Kiuchi, Takao, 4,571,042, Cl. 353-110.000.

Klatt, Alfred, to WABCO Westinghouse Fahrzeugbremsen GmbH. Gearshift lever arrangement to control the speed of shifting gears in power-assisted transmission. 4,570,502, Cl. 74-335.000.

Klaucke, Thomas; and Pigisch, Franz, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Fan drive, particularly for cooling installation of vehicles. 4,570,849, Cl. 236-35.000.

Kleczkowski, S. Peter: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,571,646, Cl. 360-99.000.

Klein, Manfred, to Metallwerk Frese GmbH. Adjustable rear view mirror. 4,571,027, Cl. 350-280.000.

Klein, Richard B.; and Scavuzzo, William S., to C. R. Bard, Inc. Tamper proof cap for syringes and the like. 4,571,242, Cl. 604-111.000.

Klett, Paul A.; Bakhshi, Shiv K.; and Granger, Mark A., to Owens-Corning Fiberglas Corporation. Foam dispenser for glass mat substrate. 4,570,859, Cl. 239-455.000.

Kleu, Gerhard. Adjustable platform scaffolding. 4,570,751, Cl. 182-131.000.

Kline, Charles M.; and Sierk, Randall L., to Sperry Corporation. Speed shifter linkage for skid-steer loader. 4,570,730, Cl. 180-6.480.

Klingel, Hans; and Matheis, Alfred, to Trumpf GmbH & Co. Die holder mechanism for a stamping machine or the like. 4,570,327, Cl. 29-568.000.

Klinkovsky, Edward R.; and Severin, William A., to Texas Instruments Incorporated. PSK modem filter switch. 4,571,731, Cl. 375-9.000.

Klissurski, Dimiter G.: *See*—
Nikolov, Valentin A.; Klissurski, Dimiter G.; and Jurov, Boyan M., 4,571,325, Cl. 422-191.000.

Klocksieben, Robert H.: *See*—
Dunn, Patrick F.; Herceg, Joseph E.; and Klocksieben, Robert H., 4,570,494, Cl. 73-863.220.

Knighton, David R., to Biogenesis, Inc. System for removing gas bubbles from liquids. 4,571,244, Cl. 604-118.000.

Knokey, Charles R.; and Bedi, Paul S., to ACL-FILCO Corporation. Refrigeration system. 4,570,449, Cl. 62-183.000.

Knollenberg, Robert G., to Particle Measuring Systems, Inc. Aerosol sampling device and method with improved sample flow characteristics. 4,571,079, Cl. 356-336.000.

Knox, Arthur C., Jr.; Hokanson, Allan E.; and Witsken, Anthony, to Knox, C. Arthur; and Witsken, Anthony. Wet grinding machine. 4,570,863, Cl. 241-33.000.

Knox, C. Arthur: *See*—
Knox, Arthur C., Jr.; Hokanson, Allan E.; and Witsken, Anthony, 4,570,863, Cl. 241-33.000.

Knox, Floris B., to Patton, Ira M. Oil well sucker rod shock absorber. 4,571,162, Cl. 417-554.000.

Knudson, Gary A. Two-part hold-down apparatus with slip joint for seamed panel assemblies. 4,570,404, Cl. 52-520.000.

Knudson, Gary A. Insulating apparatus DGK for panel assemblies. 4,570,405, Cl. 52-521.000.

Kobayashi, Haruo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Dustproofing device for thin vertically disposed camera. 4,571,043, Cl. 354-121.000.

Kobayashi, Hiroaki: *See*—
Matsui, Ichiro; Kobayashi, Hiroaki; and Sano, Hideo, 4,571,124, Cl. 405-239.000.

Kobayashi, Morio: *See*—
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.

Kobayashi, Naoki: *See*—
Horio, Motohiko; Kobayashi, Naoki; and Kaneko, Kouji, 4,571,629, Cl. 358-225.000.

Kobayashi, Nobuyuki; Isobe, Toshiaki; Ohkawa, Nobuhisa; and Kuma, Takahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Learning control system of air-fuel ratio in electronic control engine. 4,571,683, Cl. 364-431.050.

Kobayashi, Taishi: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.

Koch, Gerhard: *See*—
Erlebach, Gustav; Holze, Roland; and Koch, Gerhard, 4,571,115, Cl. 403-402.000.

Kock, Ronald W.; and Schuster, Charles E., to Bio Mechanisms, Inc. Device for exercising muscles associated with elbow tendonitis, including also the hand and wrist. 4,570,925, Cl. 272-67.000.

Kocot, Raymond H., to Burroughs Corp. Electrostatic ink jet system with potential barrier aperture. 4,571,597, Cl. 346-75.000.

Koehring Company: *See*—
Wilke, Raud A., 4,570,672, Cl. 137-596.130.

Koelsch, Peter M.: *See*—
Musser, Arlene K.; and Koelsch, Peter M., 4,571,373, Cl. 430-143.000.

Kofluk, Russell P.: *See*—
Kerfoot, Derek G. E.; Kofluk, Russell P.; and Weir, Donald R., 4,571,262, Cl. 75-101.00R.

Koga, Takashi; and Hagino, Hideyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Differential switch circuit. 4,571,508, Cl. 307-360.000.

Kohlen, Karl-Heinz, to W. Schlafhorst & Co. Device for sucking-up and holding a thread. 4,570,867, Cl. 242-35.60R.

Koizumi, Yutaka; and Akutsu, Eiichi, to Ricoh Company, Ltd. Transfer medium separation in a recording apparatus. 4,571,057, Cl. 355-3.00R.

Kokoku Rubber Industrial Company Limited: *See*—
Iida, Hideo, 4,571,466, Cl. 200-5.00A.

Kokolis, George P., to Texaco Inc. Carbon dioxide and hydrocarbon solvent flooding in a steeply dipping reservoir. 4,570,712, Cl. 166-273.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Hatori, Yoshinori; Murakami, Hitomi; and Matsumoto, Shuichi, 4,571,618, Cl. 358-136.000.

Kolla, Shanti: *See*—
Cage, James K.; Kolla, Shanti; and Gates, Jan E., 4,571,337, Cl. 426-107.000.

Kollberg, Sten, to ASEA Aktiebolag. Method of and apparatus for centrifugal casting. 4,570,698, Cl. 164-498.000.

Koller, Paul L.: *See*—
Samson, Rogelio G.; Koller, Paul L.; and Hideg, Laszlo, deceased, 4,570,598, Cl. 123-445.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Soldering apparatus. 4,570,569, Cl. 118-410.000.

Kondo, Mitsuru, to Ricoh Company, Ltd. High-speed facsimile machine capable of parallel processing. 4,571,633, Cl. 358-280.000.

Kondo, Tatsuya: *See*—
Andoh, Toshihiro; Kondo, Tatsuya; and Toguchi, Akira, 4,570,876, Cl. 242-188.000.

Kongoh, Takeshi: *See*—
Makabe, Hachiro; and Kongoh, Takeshi, 4,570,561, Cl. 112-454.000.

Konig, Karl-Heinz; Schuster, Michael; Hollmann, Dieter; and Schlodder, Rainer, to Degussa Aktiengesellschaft. Process for separation and purification of platinum group metals (II). 4,571,265, Cl. 75-108.000.

Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, to Degussa Aktiengesellschaft. Process for separation and purification of platinum group metals (I). 4,571,266, Cl. 75-108.000.

Koninklijke Eijsbouts Klokkengieterij En Fabriek Van Torenuurwerken B.V.: *See*—
Bakker, Peter, 4,570,528, Cl. 84-423.00R.

Konishi, Keizo, to Tokai Rubber Industries, Ltd. Vibration-damping structure. 4,570,911, Cl. 267-8.00R.

Konishi, Kunihiko: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; and Ohta, Masao, 4,571,329, Cl. 423-239.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Horiuchi, Tatsumi; Tamura, Takashi; and Kusuda, Tatufumi, 4,571,063, Cl. 355-8.000.
Tarumi, Noriyoshi; Fukuchi, Masakazu; and Ito, Kunio, 4,571,068, Cl. 355-14.00D.
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.

Konneker, Lloyd K. Pocketknife with integral ring fastener. 4,570,341, Cl. 30-161.000.

Konno, Hisao: *See*—
Matsubara, Yutaka; Konno, Hisao; and Sasai, Takashi, 4,570,446, Cl. 62-48.000.

Konzal, Daryl R., to Paper Machinery Corporation. Paper container bottom expander. 4,571,233, Cl. 493-109.000.

Kosmanski, Thomas J.: *See*—
Nicholson, Michael A.; and Kosmanski, Thomas J., 4,570,508, Cl. 74-535.000.

Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., to Institut Gornogo Dela Sibirskogo Otdelenia Akademii Nauk SSSR. Machine for driving holes in the ground. 4,570,723, Cl. 173-116.000.

Kowa Automobile Industrial Co, Ltd: *See*—
Ito, Yujiro, 4,570,553, Cl. 111-6.000.

Kozak, William G., to A. E. Staley Manufacturing Company. Separation of lipophilic components from solutions by adsorption. 4,571,306, Cl. 252-351.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Kelier, Herbert, 4,571,153, Cl. 415-117.000.

Kramer, DuWayne E., to Burke, Inc. Personal mobility vehicle. 4,570,739, Cl. 180-216.000.

Kramer, James H., to B. F. Goodrich Company, The. Method of making a bearing. 4,570,315, Cl. 29-149.50S.

Krase, Horst: *See*—
Drawert, Manfred; and Krase, Horst, 4,571,267, Cl. 106-27.000.

Krautkramer-Branson, Inc.: *See*—
Volkmann, Klaus, 4,570,486, Cl. 73-597.000.

Kreger, Steven J.: *See*—
Oltman, John P.; Kreger, Steven J.; and Purchase, Richard D., 4,570,392, Cl. 52-64.000.

Kreider, Gary E.: *See*—
Lee, Peter W.; Kreider, Gary E.; and Widner, Ronald L., 4,571,097, Cl. 384-469.000.

Kremer, Victor: *See*—
Lonardi, Emile; and Kremer, Victor, 4,570,900, Cl. 251-58.000.

Kress, Dieter; and Haberle, Friedrich, to MAPAL Fabrik fur Prazisionswerkzeuge, Dr. Kress KG. Reamer with self locking guide members. 4,571,130, Cl. 408-143.000.

Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., to Joy Manufacturing Company. Flue gas desulfurization. 4,571,330, Cl. 423-242.000.

Kroger, Mogens, to M. Kroger Maskinfabrik A/S. Dispensing device in the form of a caulking gun. 4,570,832, Cl. 222-325.000.

Kroll, Arthur S.: *See*—
Robinson, Kelly S.; Weitzel, Richard A.; and Kroll, Arthur S., 4,570,572, Cl. 118-657.000.

Krude, Werner: *See*—
Balken, Jochen; Krude, Werner; and Orain, Michel A., 4,571,099, Cl. 384-513.000.

Krupp Polysius AG: *See*—
Gudat, Gerhard; Blascyk, Gotthardt; and Wingenfeld, Friedrich, 4,571,176, Cl. 432-226.000.

Krynicki, Witold. Analogue to digital converter. 4,571,574, Cl. 340-347.0AD.

Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, to Nissan Motor Co., Ltd.; and Nippon Air Brake Co., Ltd. Brake pressure control valve of a double piping system. 4,571,006, Cl. 303-6.00C.

Kuboyama, Nobuyoshi. Heat-treating process and its apparatus in reducing air pressure within a chamber. 4,570,357, Cl. 34-15.000.

Kudo, Mitsuhiro: *See*—
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.

Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., to Marvin Glass & Associates. Impact responsive toy vehicle. 4,571,197, Cl. 446-6.000.

Kulick, Walter K. Dental instrument. 4,571,180, Cl. 433-72.000.

Kuma, Takahide: *See*—
Kobayashi, Nobuyuki; Isobe, Toshiaki; Ohkawa, Nobuhisa; and Kuma, Takahide, 4,571,683, Cl. 364-431.050.

Kumada, Akira: *See*—
Murata, Michihiro; and Kumada, Akira, 4,570,482, Cl. 73-290.00V.

Kumagai, Tokuo: *See*—
Okubo, Keigo; Toba, Shoji; and Kumagai, Tokuo, 4,571,287, Cl. 204-37.600.

Kumasaka, Noriyuki: *See*—
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.

Kumatani, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic clutch/brake device. 4,570,767, Cl. 192-18.00B.

Kuna, Wayne A., to Marvin Glass & Associates. Toy pull accessory for self-propelled toy vehicle. 4,571,211, Cl. 446-448.000.

Kunert, Heinz, to Saint-Gobain Vitrage. Glue mounting of a glass in a bay. 4,571,278, Cl. 156-108.000.

Kunioka, Kazuo: *See*—
Kamio, Hiroshi; Ueno, Yasushi; Noguchi, Takao; Kunioka, Kazuo; and Fukuda, Shuzo, 4,570,453, Cl. 62-375.000.

Kunst, Robert J.: *See*—
Miller, Roy W.; and Kunst, Robert J., 4,570,807, Cl. 213-60.000.

Kunstle, Gerhard; and Jung, Herbert, to Wacker-Chemie GmbH. Process for stabilizing aqueous solutions of acetoacetamides with simultaneous reduction in the content of β-aminocrotonic acid amides. 4,571,433, Cl. 564-4.000.

Kunz, Gordon F.: *See—*
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.

Kunz, Raymond W.; and Pitcher, Gerald K., to Clairol Incorporated. Vibrator massager using beat frequency. 4,570,616, Cl. 128-36.000.

Kuraishi, Yoshiaki: *See—*
Kimura, Tadakatsu; Makabe, Takayoshi; and Kuraishi, Yoshiaki, 4,571,502, Cl. 307-262.000.

Kurata, Mitsuru: *See—*
Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Sakagami, Teruo; Shoji, Masuhiro; Arakawa, Noriyuki; and Murayama, Naohiro, 4,571,390, Cl. 502-402.000.

Kuroda, Ichiro: *See—*
Nishitani, Takao; Kuroda, Ichiro; and Kato, Tadaharu, 4,571,737, Cl. 375-27.000.

Kuroda, Kouki: *See—*
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, 4,571,725, Cl. 371-25.000.

Kurokawa, Yuji: *See—*
Ueno, Hideo; and Kurokawa, Yuji, 4,571,100, Cl. 400-17.000.

Kurosaki Refractories Co., Ltd.: *See—*
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.

Kurose, Isoji. Method of electrically synthesizing sense of taste. 4,570,636, Cl. 128-419.00R.

Kurtti, Gary R., to General Motors Corporation. Sensor sensitivity reducer for door mounted retractor. 4,570,873, Cl. 242-107.40A.

Kurtz, Robert J.; and LiCausi, Joseph, to BioResearch Inc. Adjustable orthopedic shoe for a foot splint. 4,570,620, Cl. 128-80.00A.

Kusabuka, Yoshito: *See—*
Ono, Toshiaki; and Kusabuka, Yoshito, 4,571,102, Cl. 400-248.000.

Kusagawa, Shiro: *See—*
Ishii, Takashi; Murata, Shinichi; Kusagawa, Shiro; and Wakasaki, Miyoshi, 4,570,695, Cl. 164-463.000.

Kusuda, Tatufumi: *See—*
Horiuchi, Tatsumi; Tamura, Takashi; and Kusuda, Tatufumi, 4,571,063, Cl. 355-8.000.

Kuwabara, Hidemitsu: *See—*
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, 4,571,357, Cl. 428-153.000.

Kuwahara, Hisao, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor voltage supply circuit having constant output voltage characteristic. 4,571,536, Cl. 323-311.000.

Kuwahara, Kunisuke: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, 4,571,338, Cl. 426-324.000.

Kuwakado, Satosi: *See—*
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.

Kuwano, Hiroaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method and apparatus for controlling lateral unstable movement and camber of strip being rolled. 4,570,472, Cl. 73-8.000.

L. & C. Steinmuller GmbH: *See—*
Weber, Rolf; Pollak, Gerd; and Chlechowitz, Arno, 4,570,813, Cl. 220-3.000.

L & M Radiator, Inc.: *See—*
Braun, Richard R.; and Cedar, Charles E., 4,570,704, Cl. 165-162.000.

La Telemecanique Electrique: *See—*
Belbel, Elie; Haury, Andree ; Blanchard, Christian; and Lauraire, Michel, 4,571,565, Cl. 335-16.000.

Laauwe, Robert H.: *See—*
Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., 4,570,827, Cl. 222-95.000.

Labbe, Francis A. M.: *See—*
Ahern, Ronald A.; Dyett, Derek H.; Labbe, Francis A. M.; and Wood, Godfrey A., 4,570,644, Cl. 131-109.00R.

Labelle, Raymond R. Ventilating unit for animal buildings. 4,570,532, Cl. 98-34.500.

Labock, Yoram; Feuerstein, Israel; and Geiger, Avi. Electronic monitoring system particularly useful as an electronic babysitter. 4,571,455, Cl. 179-2.00A.

Labombarde, Raymond A. Non-rebound mechanism for right angle transfer in folder gluers. 4,571,234, Cl. 493-182.000.

Lade, Robert W.; Benjamin, James A.; and Schutten, Herman P., to Eaton Corporation. Lateral bidirectional dual notch shie'ded FET. 4,571,513, Cl. 307-577.000.

Lade, Robert W.: *See—*
Benjamin, James A.; Lade, Robert W.; Schutten, Herman P.; and Jaskolski, Stanley V., 4,571,606, Cl. 357-23.400.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., 4,571,512, Cl. 307-577.000.

Ladish Co.: *See—*
Zimmerly, Robert D., 4,570,665, Cl. 137-240.000.

Lagemann, Bernd: *See—*
Guttler, Hermann; and Lagemann, Bernd, 4,570,429, Cl. 57-81.000.

Lagodka, Gunter: *See—*
Merten, Gerhard; and Lagodka, Gunter, 4,571,127, Cl. 405-299.000.

Lama, William L.; and Rees, James D., to Xerox Corporation. Two row reduction/enlargement gradient index lens array. 4,571,022, Cl. 350-96.250.

Lamirande, Donald J.: *See—*
Atkins, Terrance J.; Field, Martin J.; and Lamirande, Donald J., 4,570,602, Cl. 123-468.000.

Lamle, Stewart M. Obverse/reverse domino game set. 4,570,940, Cl. 273-296.000.

Langley, John: *See—*
Symes, Ken C.; Langley, John; and Flesher, Peter, 4,571,422, Cl. 536-114.000.

Langouet, Luc, to Zimmern, Bernard. Pressure-ratio threshold sensor and a machine processing a liquefiable gas and equipped with such a sensor. 4,570,451, Cl. 62-228.300.

Lapertosa, Samuel P., to Sales Tools, Inc. Looseleaf notebook arrangement. 4,571,109, Cl. 402-77.000.

Lapshina, Lidia V.: *See—*
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Larson, Spencer B.; Johnson, Richard H.; Hennemann, Thomas L., Jr.; and Copeland, James L., to Economics Laboratory, Inc. Solid cast detergent dispenser with insert for holding noncompatible chemical. 4,571,327, Cl. 422-263.000.

Laser Products Corporation: *See—*
Matthews, John W., 4,570,466, Cl. 70-99.000.

Lauer, Edward W.: *See—*
Dean, Charles F.; Lauer, Edward W.; and Riggs, David L., 4,570,658, Cl. 137-68.200.

Lauraire, Michel: *See—*
Belbel, Elie; Haury, Andree ; Blanchard, Christian; and Lauraire, Michel, 4,571,565, Cl. 335-16.000.

Lawrence, Richard W.: *See—*
Bruynesteyn, Albert; Hackl, Ralph P.; Lawrence, Richard W.; and Vizsolyi, Andrew I., 4,571,387, Cl. 435-262.000.

Lawson, Jimmie B.: *See—*
Falls, Andrew H.; Lawson, Jimmie B.; and Hirasaki, George J., 4,570,711, Cl. 166-272.000.

Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., to United Technologies Corporation. Process for producing binderless carbon or graphite articles. 4,571,317, Cl. 264-29.100.

Leal, Manuel J. Bow sight. 4,570,352, Cl. 33-265.000.

Leary, David F., to Raychem Corporation. Method and apparatus for electrically heating diesel fuel. 4,571,481, Cl. 219-205.000.

Leavitt, Richard P.: *See—*
Wortman, Donald E.; and Leavitt, Richard P., 4,571,726, Cl. 372-2.000.

Lebedev, Oleg V.: *See—*
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, to Robert Bosch GmbH. Pump/nozzle unit for fuel injection in internal combustion engines. 4,571,161, Cl. 417-499.000.

Lecinski, Frank H.; and Banich, John N., Sr., to Continental White Cap, Inc. Plastic closure with flowed-in plastisol lining. 4,570,811, Cl. 215-343.000.

Lee, Douglas J.: *See—*
Skupnjak, Joseph A.; Lee, Douglas J.; and Becker, Neil J., 4,571,709, Cl. 365-233.000.

Lee, Jenson K. S.; and Vora, Mahasukh, to Varian Associates, Inc. Scaling circuit for remote measurement system. 4,571,588, Cl. 340-870.130.

Lee, Peter W.; Kreider, Gary E.; and Widner, Ronald L., to Timken Company, The. Tapered roller bearing with pressurized rib ring. 4,571,097, Cl. 384-469.000.

Lee, Richard B.: *See—*
Burton, James A.; and Lee, Richard B., 4,570,977, Cl. 285-39.000.

Lee, Roy, Jr. Method of and apparatus for the hydrostatic testing of threaded pipe. 4,570,485, Cl. 73-49.500.

Leemhuis, Louis J. Variable orifice air flow measuring device and method. 4,570,493, Cl. 73-861.620.

Lege, Curtis S., to Westvaco Corporation. C_{22}-Cycloaliphatic tricarboxylic acid derived isethionate esters and method of preparation. 4,571,309, Cl. 260-400.000.

Legerius, Bengt E.; and Siebert, Hans W., to Telefonaktiebolaget L M Ericsson. Method and tool for inserting an overdimensioned elastic body in a cavity. 4,570,323, Cl. 29-451.000.

Leggett, Clarence A.; and Leggett, Ronald L. Safety stunning tip and trap retrieving hook and method of use thereof. 4,570,376, Cl. 43-96.000.

Leggett, Ronald L.: *See—*
Leggett, Clarence A.; and Leggett, Ronald L., 4,570,376, Cl. 43-96.000.

LeGrand, Donald G.; and Olszewski, William V., to General Electric Company. Method for increasing the adhesion of polydiorganosiloxane-polycarbonate block copolymer interlayers to adjoining laminae and primer composition to accomplish same. 4,571,280, Cl. 156-329.000.

Lehman, Richard F., to Xerox Corporation. Flash illumination and optical imaging system. 4,571,058, Cl. 355-3.00R.

Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, to General Foods Corporation. Method for producing cold-water soluble gelatin dessert mixes and products therefrom. 4,571,346, Cl. 426-576.000.

Leibovitz, Howard: *See*—
Roxton, George F.; and Leibovitz, Howard, 4,570,677, Cl. 137-881.000.

Leitch, Paul A.; Chang, Robert C.; and Thompson, Randy E., to Warner & Swasey Company, The. Method of adaptive grinding. 4,570,389, Cl. 51-325.000.

Leland Stanford Junior University, Board of Trustees of the: *See*—
Lusignan, Bruce B.; Sytwu, James; and Badawi, Amr, 4,571,723, Cl. 370-110.200.

Lengenfelder, William G., Jr.; and Barbie, Paul E., to Modern Machine Works Inc. Sheave assembly. 4,571,225, Cl. 474-176.000.

Lenke, Dieter: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Leo, Rolf: *See*—
Nowak, Franz; Gietl, Albert; Leo, Rolf; and Singer, Gerhard, 4,571,005, Cl. 301-63.0PW.

Leonard, James S.: *See*—
Almond, Charles B.; and Leonard, James S., 4,571,282, Cl. 162-47.000.

Leone-Bay, Andrea; and Timony, Peter E., to Stauffer Chemical Company. Herbicidal esters of N-substituted 2-bromo-4-methylimidazole-5-carboxylic acid. 4,571,257, Cl. 71-92.000.

Lerom, George A.: *See*—
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.

Lerouge, Claude P. H., to International Standard Electric Corp. Integrated circuit fast multiplier structure. 4,571,701, Cl. 364-757.000.

Leshik, Richard R.: *See*—
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.

Leslie Hartridge Limited: *See*—
Cox, Gordon C.; and Shorrock, Peter, 4,570,839, Cl. 227-1.000.

Levenstein, Norm: *See*—
Reichel, Kenneth; Nichols, Frederick W., III; and Levenstein, Norm, 4,571,717, Cl. 369-256.000.

Lever Brothers Company: *See*—
Izzo, Henry J.; and McNaught, John P., 4,571,347, Cl. 426-581.000.

Lewanski, Richard M.; and Buggele, Norman R., to Sommer & Maca Industries, Inc. Yieldable gripper unit. 4,570,785, Cl. 198-628.000.

Lewis, Gary D.: *See*—
Stoddart, Hugh F.; and Lewis, Gary D., 4,570,638, Cl. 128-665.000.

Liba Maschinenfabrik GmbH: *See*—
Hagel, Adolf, 4,570,459, Cl. 66-120.000.

Libbey-Owens-Ford Company: *See*—
Revells, Robert G.; and Enk, Allan T., 4,571,253, Cl. 65-273.000.

Librecht, Freddy M.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; Van Peteghem, Willy F.; and De Cock, Etienne M., 4,571,602, Cl. 346-160.000.

LiCausi, Joseph: *See*—
Kurtz, Robert J.; and LiCausi, Joseph, 4,570,620, Cl. 128-80.00A.

Lidy, Werner A.: *See*—
Dolden, John G.; Fogg, Sidney G.; and Lidy, Werner A., 4,571,413, Cl. 524-199.000.

Lieber, Richard L.; and Baskin, Ronald J., to University of California, The Regents of the. Surgical myometer method. 4,570,641, Cl. 128-774.000.

Lietz, Helmut: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Lin, Ming-Hsin. Automatic protective circuit system for emergency lights. 4,571,531, Cl. 320-2.000.

Lindenberger, James N.; Christie, Bert M.; and Johnson, Roy V., to Dow Industries. Shielded door assembly. 4,571,449, Cl. 174-35.0MS.

Linder, George E.: *See*—
Minnebraker, Jeffrey P.; and Linder, George E., 4,570,756, Cl. 188-2.00F.

Lindow, Dale W., to General Motors Corporation. Loading washer assembly. 4,571,133, Cl. 411-11.000.

Lindsjo, Ulf J. M., to Tetra Pak International AB. Packing container with fold-out pouring spout. 4,570,788, Cl. 229-17.00R.

Linkous, Clovis A.: *See*—
Skotheim, Terje A.; O'Grady, William E.; and Linkous, Clovis A., 4,571,029, Cl. 350-357.000.

Linsker, Ralph; and Rutter, Roger S., to International Business Machines Corporation. Method for routing electrical connections and resulting product. 4,571,451, Cl. 174-68.500.

Lisco, Richard J., to AT&T Bell Laboratories. LED Driver Circuit. 4,571,506, Cl. 307-311.000.

Little, Lawrence J.: *See*—
Hunter, Joe S.; and Little, Lawrence J., 4,570,507, Cl. 74-5.120.

Litton Bionetics, Inc.: *See*—
Schroit, Alan J.; and Fidler, Isaiah J., 4,571,332, Cl. 424-1.100.

Liu, Chung-Chiun; and Karagounis, Vasilios A., to Case Western Reserve University. Apparatus for electrochemical measurements. 4,571,292, Cl. 204-412.000.

Lods, Jean; and Trinh Van, Christian, to Societe Anonyme de Telecommunications. 16-QAM Modulator with PLL amplification devices. 4,571,549, Cl. 332-16.00R.

Lohman, Donald J., to Cincinnati Fiber Inc. Composition useful as a cat litter, plant mulch, or grease and oil absorbent. 4,570,573, Cl. 119-1.000.

Lohn, Edwin E. Universal holder for mounting handguns remote from the user. 4,570,890, Cl. 248-274.000.

Loizeau, Pierre, to Valeo. Torsion damping device, especially a clutch plate for a motor vehicle. 4,570,774, Cl. 192-106.200.

Lonardi, Emile; and Kremer, Victor, to Paul Wurth S.A. Apparatus for actuating a proportioning valve. 4,570,900, Cl. 251-58.000.

Long, Delmar D., to Dayco Corporation. Apparatus for producing elastomer-coated bias reinforcement fabric. 4,570,566, Cl. 118-34.000.

Longoria, Jose L.: *See*—
Ray, Levon L.; and Longoria, Jose L., 4,570,380, Cl. 47-58.000.

Lorenz, Edmund. Pulse-controlled turbine. 4,570,438, Cl. 60-39.390.

Lott, W. Gerald, to Flo Trend Systems, Inc. Two stage desilter. 4,571,296, Cl. 209-211.000.

Lowrey, Charles. Foldable chair. 4,570,994, Cl. 297-19.000.

Lucas, Stephen G.: *See*—
Schell, James E., deceased; Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., 4,571,291, Cl. 204-213.000.

Luccarelli, Domenick, Jr.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,343, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,344, Cl. 426-535.000.

Luckett, Robert H. Insulated food carrier. 4,570,800, Cl. 206-545.000.

Ludwig, George C.: *See*—
Dodson, Daniel P.; and Ludwig, George C., 4,570,912, Cl. 267-64.150.

Luk, King: *See*—
Howarth, Thomas T.; and Luk, King, 4,571,392, Cl. 514-210.000.

Lukas, Peter, to P.M. Sports Development Limited. Earthworm harvesting method. 4,570,372, Cl. 43-1.000.

Lund, Robert S. Mold-blowing apparatus. 4,570,694, Cl. 164-158.000.

Lundstrom, Malkolm S.: *See*—
Buren, Kurt J. A.; Hedlund, Martin L.; and Lundstrom, Malkolm S., 4,571,261, Cl. 75-77.000.

Lusignan, Bruce B.; Sytwu, James; and Badawi, Amr, to Leland Stanford Junior University, Board of Trustees of the. Pulse code modulated digital telephony tone generator. 4,571,723, Cl. 370-110.200.

Lustenberger, Martin, to Vibro-Meter SA. Process for detecting the likelihood of ice formation, ice warning system for carrying out the process and utilization thereof. 4,570,881, Cl. 244-134.00F.

Lygas, Edward A.: *See*—
Birchak, James R.; and Lygas, Edward A., 4,571,693, Cl. 364-509.000.

Lynell Medical Technology, Inc.: *See*—
Poler, Stanley, 4,571,040, Cl. 351-160.00R.

Lystad, Leonard A., to General Motors Corporation. Sun visor stowed on pillar. 4,570,991, Cl. 296-97.00G.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Rottstedt, Hans-Jurgen, 4,570,539, Cl. 101-426.000.

M.C.L. Co., Ltd.: *See*—
Sasaki, Nobuyoshi, 4,571,270, Cl. 134-5.000.

M. Kroger Maskinfabrik A/S: *See*—
Kroger, Mogens, 4,570,832, Cl. 222-325.000.

M. Y. Finkelman Company: *See*—
Finkelman, Steven L.; and Tseitlin, Moshe, 4,570,349, Cl. 33-143.00L.

MacConkey, James S.; and Melville, Douglas F., Jr., to Acme United Corporation. Membrane dispensing assembly and method of manufacture. 4,570,627, Cl. 128-132.00D.

Machen, Edmond H.: *See*—
Seagrave, Earl M.; and Machen, Edmond H., 4,570,571, Cl. 118-642.000.

Machinefabriek G.J. Nijhuis B.V.: *See*—
Nijhuis, Gerrit J., 4,570,297, Cl. 17-16.000.

Machnee, Cecil B., to Morris Rod Weeder Co. Ltd. Rate meter and method of determining distribution rates. 4,570,491, Cl. 73-861.000.

MacKinnon, John W. M.: *See*—
Hayes, Roger; Bays, David E.; and MacKinnon, John W. M., 4,571,394, Cl. 514-212.000.

MacLaughlin, Donald; and Fortuna, Vincent E., to Cosden Technology, Inc. Braking apparatus for spinwelding machinery. 4,571,281, Cl. 156-580.000.

Mader, Josef: *See*—
Ziegler, Klaus; Zund, Peter; Gees, Jurg; and Mader, Josef, 4,571,028, Cl. 350-287.000.

Madi, Jeno: *See*—
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, 4,570,964, Cl. 280-403.000.

Maeda, Susumu; Taki, Masakazu; and Yoshizawa, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Welding machine with automatic seam tracking. 4,571,479, Cl. 219-124.340.

Maegdefessel, Heinz, to Siemens Aktiengesellschaft. Getter sorption pump with heat accumulator for high-vacuum and gas discharge systems. 4,571,158, Cl. 417-51.000.

Maezono, Masakazu: *See*—
Nishimura, Sadanori; and Maezono, Masakazu, 4,570,511, Cl. 74-867.000.
Maffione, Joseph P.: *See*—
Gomes, Robert L.; and Maffione, Joseph P., 4,570,637, Cl. 128-639.000.
Maggioni Farmaceutici S.p.A.: *See*—
Picciola, Giampaolo; Gentili, Piergiorgio; Ravenna, Franco; and Riva, Mario, 4,571,401, Cl. 514-332.000.
Magic Pantry Foods Inc.: *See*—
Taylor, Larry W., 4,570,339, Cl. 30-2.000.
Magic Seal Corporation: *See*—
Nevins, Norman; and Gustafson, Thomas L., 4,571,410, Cl. 523-122.000.
Magna Motive Industries, Inc.: *See*—
McGee, Daniel W.; Rosinski, Stephan; and Setzer, Claude S., 4,571,528, Cl. 318-138.000.
Magnetic Peripherals, Inc.: *See*—
Goss, Lloyd C., 4,571,649, Cl. 360-106.000.
Magyar Optikai Muvek: *See*—
Szemere, Robert; Majoros, Jozsef; and Cseve, Ferenc, 4,570,838, Cl. 225-93.000.
Magyar Tudomanyos Akademia Muszaki Fizikai Kutato Intezete: *See*—
Ferenczi, Gyorgy; Boda, Janos; Toth, Ferenc; Horvath, Peter; Benkovics, Laszlo ; and Dozsa, Laszlo , 4,571,541, Cl. 324-158.00D.
Mahmoodi, A. B.; and Nelson, Owen L., to Minnesota Mining and Manufacturing Company. Method of image enhancement by raster scanning. 4,571,635, Cl. 358-284.000.
Maillefer S.A.: *See*—
Buluschek, Bruno E., 4,570,875, Cl. 242-158.00R.
Major, Jonathan C.: *See*—
Chandra, Tapan K.; and Major, Jonathan C., 4,571,123, Cl. 405-212.000.
Majoros, Jozsef: *See*—
Szemere, Robert; Majoros, Jozsef; and Cseve, Ferenc, 4,570,838, Cl. 225-93.000.
Makabe, Hachiro; and Kongoh, Takeshi, to Janome Sewing Machine Industry Co., Ltd. Electronic sewing machine. 4,570,561, Cl. 112-454.000.
Makabe, Takayoshi: *See*—
Kimura, Tadakatsu; Makabe, Takayoshi; and Kuraishi, Yoshiaki, 4,571,502, Cl. 307-262.000.
Makita, Fujio, to Fuji Jukogyo Kabushiki Kaisha. Gearshift system for an automobile. 4,570,765, Cl. 192-3.560.
Mallinckrodt, Inc.: *See*—
Caskey, Douglas C.; and Chapman, Douglas W., 4,571,437, Cl. 564-418.000.
Malmgren, Bengt-Goran, to HB BGM Innovation. Device for supplying solid fuel to a furnace. 4,571,137, Cl. 414-173.000.
Mammone, Joseph F., to Du Pont de Nemours, E. I., and Company. Hybrid composite of poly(p-phenylene-trans-bisbenzothiazole) and ceramic fiber. 4,571,411, Cl. 523-457.000.
Mann Packing Co., Inc.: *See*—
Centeno, Edward M., 4,570,415, Cl. 53-399.000.
Mannesmann Rexroth GmbH: *See*—
Mucheyer, Norbert, 4,571,500, Cl. 307-154.000.
Manning, Peter R.; and Dixon, A. John. Articulated toy figure. 4,571,209, Cl. 446-375.000.
Mantellina, Calogero; Zanzottera, Daniele; and Gelmetti, Marco, to Honeywell Information Systems Italia. Memory module selection and reconfiguration apparatus in a data processing system. 4,571,676, Cl. 364-200.000.
MAPAL Fabrik fur Prazisionswerkzeuge, Dr. Kress KG: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,571,130, Cl. 408-143.000.
Marass, Josef, to Georg Spiess GmbH. Sheet feeder for a sheet processing machine having a continuously running sheet intake. 4,570,917, Cl. 270-53.000.
Maremont Corporation: *See*—
Ortyl, George M., 4,570,747, Cl. 181-243.000.
Maresca, Louis M., to Union Carbide Corporation. Blends of novel poly(ester-carbonate)s with other polymers. 4,571,419, Cl. 525-177.000.
Marinov, Marin P.: *See*—
Genev, Ivan V.; Bagarov, Stefan T.; Genev, Evtim V.; Drakaliiski, Boris Y.; Marinov, Marin P.; and Kirilov, Kosta Y., 4,570,864, Cl. 241-252.000.
Marks, Allen P., to Rohm and Haas Company. Quick-cure, flexible polymer composition. 4,571,420, Cl. 525-350.000.
Martin, Hardison G.; and Ponto, Robert, to Innovative Electronic Designs, Inc. Balanced amplifier device. 4,571,554, Cl. 330-252.000.
Martin, Harvey G.; and Bruin, Nicholas A., to De La Rue Systems Limited. Secure container and actuator for a sheet dispensing apparatus. 4,570,548, Cl. 109-66.000.
Martin, Joel; and Boire, Maxime, to Simmonds S.A.; and Societe Nationale Industriele et Aerospatiale. Encaged nut. 4,571,135, Cl. 411-85.000.
Martin Paul, Inc.: *See*—
Belokin, Martin P., 4,570,837, Cl. 225-42.000.
Martin, Robert G.: *See*—
Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., 4,571,724, Cl. 371-25.000.
Martin, Robin A., to Wilson Sporting Goods Co. Basketball. 4,570,931, Cl. 273-65.0EG.
Martin, William J., to International Business Machines Corporation. VFET Driving circuits for plasma panel display systems. 4,571,527, Cl. 315-169.400.
Martinson, Glen D., to B.E.L.-Tronics Limited. Horn antenna and mixer construction for microwave radar detectors. 4,571,593, Cl. 343-783.000.
Martus, Donald G. Tire pressure regulation system. 4,570,691, Cl. 152-332.100.
Maruta, Keiji, to Sony Corporation. Driving apparatus for an objective lens. 4,571,026, Cl. 350-247.000.
Marvin Glass & Associates: *See*—
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Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., 4,571,197, Cl. 446-6.000.
Kuna, Wayne A., 4,571,211, Cl. 446-448.000.
Zaruba, John V.; Meyer, Burton C.; and Hanson, Steven P., 4,571,205, Cl. 446-230.000.
Zaruba, John V.; Andersen, Michael A.; and Meyer, Burton C., 4,571,210, Cl. 446-424.000.
Marzullo, Joseph H., to Pitney Bowes Inc. Device for locking a slidable member. 4,570,757, Cl. 188-67.000.
Maschinenfabrik Koppern GmbH & Co. KG: *See*—
Blank, Michael G.; and Hammerschmidt, Horst E., 4,571,171, Cl. 425-533.000.
Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG: *See*—
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Masham, Roger D., to Xerox Corporation. Mixing device for particulate material. 4,570,570, Cl. 118-612.000.
Masica, Michael T.; Wong, Albert C.; and Yonker, John F., to General Motors Corporation. Demand responsive flow regulator valve. 4,570,667, Cl. 137-117.000.
Mason Corporation: *See*—
McKibbin, John R., 4,570,749, Cl. 182-36.000.
Massachusetts Institute of Technology: *See*—
Suh, Nam P.; and Burgess, Steven M., 4,571,358, Cl. 428-155.000.
Massof, Edward P.: *See*—
Beglinger, Gregory O.; Massof, Edward P.; and Schwind, Richard J., 4,571,134, Cl. 411-41.000.
Masterfield, Ernest W. Archery bow stabilizer and vibration dampener. 4,570,608, Cl. 124-89.000.
Masuda, Mitsuya: *See*—
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Matheis, Alfred: *See*—
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Matheson, Thomas G., to AT&T Bell Laboratories. System, method, and station interface arrangement for playing video game over telephone lines. 4,570,930, Cl. 273-1.00E.
Mathews, Harlan P.; Romano, Paul; and Muckle, Alexander M., to Storage Technology Partners II. Read beam position calibration. 4,571,714, Cl. 369-44.000.
Matlach, William J.; Newberry, Michael E.; and Thierheimer, Charles L., Jr., to Petrolite Corporation. Method of transporting viscous hydrocarbons. 4,570,656, Cl. 137-13.000.
Matsubara, Yutaka; Konno, Hisao; and Sasai, Takashi, to Mitsui & Co., Ltd.; and Japan Metals and Chemicals Co., Ltd. Fuel tank for hydrogen vehicle and fuel supplying system. 4,570,446, Cl. 62-48.000.
Matsuda, Takashi, to Takara Co., Ltd. Toy gun convertible into robotic-humanoid form. 4,571,201, Cl. 446-85.000.
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Matsui, Ichiro; Kobayashi, Hiroaki; and Sano, Hideo, to Sumitomo Cement Co., Ltd. Method of forming cast-in-place concrete pile. 4,571,124, Cl. 405-239.000.
Matsumoto, Keizo: *See*—
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Tsutsumi, Takashi; and Matsumoto, Shuji, 4,570,969, Cl. 280-664.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Iyehara, Sadahiro; Inohara, Shizuo; Masuda, Mitsuya; Ueda, Minoru; and Yamamoto, Keisuke, 4,571,614, Cl. 358-56.000.
Saito, Koetsu; Kawabuchi, Masami; Yamaguchi, Keisaku; and Iijima, Keiji, 4,571,520, Cl. 310-327.000.
Sugawara, Norio; and Nawa, Motoyuki, 4,570,533, Cl. 98-40.240.
Yamada, Takahiro, 4,571,626, Cl. 358-213.000.
Yata, Kei, 4,571,459, Cl. 179-6.130.
Matsushita Electric Works, Ltd.: *See*—
Kawaguchi, Shojiro; and Odaka, Kuniyuki, 4,570,272, Cl. 4-302.000.
Saur, Hans, 4,571,566, Cl. 335-78.000.
Matsushita, Masatoshi: *See*—
Hatada, Minoru; Ishida, Hideaki; and Matsushita, Masatoshi, 4,571,672, Cl. 364-200.000.

Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Ohkoshi, Tokio, to Hitachi, Ltd. Semiconductor device having electrically insulating substrate of SiC. 4,571,610, Cl. 357-67.000.

Matsuzaki, Hikaru; and Matsuzaki, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing anode cylinders of electron tubes. 4,570,843, Cl. 228-151.000.

Matsuzaki, Masaru: *See—*
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, 4,571,338, Cl. 426-324.000.

Matsuzaki, Toshiyuki: *See—*
Matsuzaki, Hikaru; and Matsuzaki, Toshiyuki, 4,570,843, Cl. 228-151.000.

Mattel, Inc.: *See—*
Barbato, Michael W.; Rhodes, Tony; and Watts, Edward W., 4,571,198, Cl. 446-73.000.
Henderson, Richard E.; and Wittenberg, Mark S., 4,571,207, Cl. 446-352.000.
Serna, Jaime, 4,571,200, Cl. 446-85.000.

Matthews, John W., to Laser Products Corporation. Door locking methods and apparatus. 4,570,466, Cl. 70-99.000.

Matthias, Terry R.; and Barr, John D., to NL Industries, Inc. Drill bit cutter. 4,570,725, Cl. 175-329.000.

Matzner, Bruce: *See—*
Johansson, Eric B.; and Matzner, Bruce, 4,571,324, Cl. 376-441.000.

Mauer, Dieter: *See—*
Richmond, John F.; Mauer, Dieter; and Baum, Heinz O., 4,570,303, Cl. 24-16.0PB.

Maxwell, Michael J., to Rogers Corporation. Tape automated bonding of integrated circuits. 4,571,354, Cl. 428-78.000.

May, Randall L. Electro-acoustically amplified drum and mounting bracket. 4,570,522, Cl. 84-1.140.

Mayer, John F.; Cook, Stuart A.; Springer, Harvey G.; and Wood, Earl M., Jr., to CPG Products Corp. Action figure with wing movement derived from leg movement. 4,571,206, Cl. 446-330.000.

Mayer, Wolfgang: *See—*
Murawski, Peter; and Mayer, Wolfgang, 4,570,565, Cl. 178-2.00R.

Mayfield, Michael J.: *See—*
Burns, Charles S.; Crabtree, Michael R.; Gourneau, Dwight A.; Hinkel, Scott W.; Lerom, George A.; and Mayfield, Michael J., 4,571,671, Cl. 364-200.000.

Mayfield, Terry D.: *See—*
Kendrick, William D.; and Mayfield, Terry D., 4,570,673, Cl. 137-615.000.

Mayo, Ronnie D. Fish stringer. 4,570,836, Cl. 224-103.000.

Mazda Motor Corporation: *See—*
Mukai, Yoshiaki; and Ueno, Iwao, 4,570,968, Cl. 280-664.000.
Murata, Yoshinori, 4,571,165, Cl. 418-178.000.

McCain Manufacturing Corporation: *See—*
Higgins, George D.; and Wrona, James, 4,570,535, Cl. 100-7.000.

McCall, Kenneth E.: *See—*
Johnson, David E.; Abersold, Larry A.; and McCall, Kenneth E., 4,571,478, Cl. 219-69.00R.

McCoy, Gregory A., to Ingersoll-Rand Company. Multi-wheel drive system. 4,570,741, Cl. 180-242.000.

McCullough, Robert B., to Sunol Systems Incorporated. Synchronization-promoting data coding method. 4,571,575, Cl. 340-347.0DD.

MCD Enterprises, Inc.: *See—*
McDermott, John, 4,570,850, Cl. 236-49.000.

McDermott, John, to MCD Enterprises, Inc. Modular ceiling air control device. 4,570,850, Cl. 236-49.000.

McDermott, Keith T.: *See—*
Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., 4,571,090, Cl. 366-270.000.

McDonald Products Corporation: *See—*
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.

McGee, Daniel W.; Rosinski, Stephan; and Setzer, Claude S., to Magna Motive Industries, Inc. Electromagnetic rotary motor. 4,571,528, Cl. 318-138.000.

McGinniss, Vincent D.; and Schwerzel, Robert E., to Battelle Memorial Institute. Photopolymerizable composition containing a photosensitive donor and photoinitiating acceptor. 4,571,377, Cl. 430-81.000.

McKibbin, John R., to Mason Corporation. Suspended scaffold. 4,570,749, Cl. 182-36.000.

McLaurin, Lauchlin A., to V.E. Kuster Company. Instrument locking and port bundle carrier. 4,570,481, Cl. 73-152.000.

McLellan, Norvel J. Automatic bath water temperature control. 4,570,848, Cl. 236-12.210.

McNaught, John P.: *See—*
Izzo, Henry J.; and McNaught, John P., 4,571,347, Cl. 426-581.000.

McPeak, Ercel W.; Felzer, Theodore; and Rodgers, Frederick J., to Ultra Lift Corporation. Stair-climbing hand truck. 4,570,953, Cl. 280-5.300.

McPherson, Hugh, to Ferranti plc. Electrical circuit assemblies. 4,571,663, Cl. 361-393.000.

Mead Corporation, The: *See—*
King, Robert D.; and Henderson, James M., 4,571,160, Cl. 417-437.000.

Mears, Lawrence N., to Center Line Industries, Inc. Rapid loader device. 4,570,371, Cl. 42-90.000.

Medi-Physics, Inc.: *See—*
Byrne, Edmund F.; and Tolman, Glen L., 4,571,430, Cl. 560-148.000.

Mednis, Juris M., to Universal Symetrics Corporation. Multiple container package. 4,570,799, Cl. 206-509.000.

Medosan Industrie Biochimiche Riunite S.p.A.: *See—*
Baglioni, Alessandro, 4,571,399, Cl. 514-265.000.

Meeker, Rick A.: *See—*
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,570,278, Cl. 15-97.00R.

Meenan, Vincent D. Adjustable tray for video display terminals. 4,570,804, Cl. 211-126.000.

Megadiamond Industries, Inc.: *See—*
Hall, David R., 4,570,726, Cl. 175-410.000.

Meise, William H.: *See—*
Dischert, Robert A.; Meise, William H.; and Berard, Clement A., Jr., 4,571,511, Cl. 307-547.000.

Meiser, Sue M.; and Cassidy, Michael F., to Warren Company. Jigsaw puzzle. 4,570,936, Cl. 273-157.00R.

Melville, Douglas F., Jr.: *See—*
MacConkey, James S.; and Melville, Douglas F., Jr., 4,570,627, Cl. 128-132.00D.

Melzer, Harald; and Hahn, Joachim, to Bayerische Motoren Werke AG. Apparatus for adjusting the valve control of a reciprocating piston internal combustion engine. 4,570,334, Cl. 29-700.000.

Memorial Hospital for Cancer and Allied Diseases: *See—*
Miodownik, Saul, 4,570,639, Cl. 128-718.000.

Menard, Raymond A.: *See—*
Turner, Dewayne; Menard, Raymond A.; and Oneal, Dean, 4,570,714, Cl. 166-278.000.

Mentele, Pat. Device for weeding vine or similar crops. 4,570,721, Cl. 172-99.000.

Mepco/Electra, Inc.: *See—*
Hyland, William J., 4,571,664, Cl. 361-433.000.

Merle, Jean-Pierre, to ENERTEC. Magnetic cassette with floating and auxiliary tensioning rollers. 4,571,655, Cl. 360-132.000.

Merriman, Henry H. Bedding support. 4,570,275, Cl. 5-505.000.

Mersiovsky, Lynda K.: *See—*
Emry, Carl A., Jr.; Neuman, Grover H.; Mersiovsky, Lynda K.; and Pfeuffer, Margaret S., 4,571,700, Cl. 364-900.000.

Merten, Gerhard; and Lagodka, Gunter, to Gewerkschaft Eisenhutte Westfalia. Advance mechanism for mine roof support units. 4,571,127, Cl. 405-299.000.

Merten, Gerhard: *See—*
Roling, Franz; Merten, Gerhard; and Steinkuhl, Bernd, 4,571,003, Cl. 299-33.000.

Mesdan S.p.A.: *See—*
Premi, Mauro; and Guzzoni, Gianfranco, 4,570,427, Cl. 57-22.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Nowak, Franz; Gietl, Albert; Leo, Rolf; and Singer, Gerhard, 4,571,005, Cl. 301-63.0PW.

Metallwerk Frese GmbH: *See—*
Klein, Manfred, 4,571,027, Cl. 350-280.000.

Metromail Corporation: *See—*
Gieson, Clarence L., 4,571,141, Cl. 414-417.000.

Metzeler Kautschuk GmbH: *See—*
Ghibu, Michael; Hartel, Volker; Heynemann, Carl; and Raubach, Manfred, 4,570,748, Cl. 181-286.000.

Mewitz, Gerd, to General Electric Company. Programmable video mask generator. 4,571,619, Cl. 358-160.000.

Meyer, Burton C.: *See—*
Zaruba, John V.; Meyer, Burton C.; and Hanson, Steven P., 4,571,205, Cl. 446-230.000.
Zaruba, John V.; Andersen, Michael A.; and Meyer, Burton C., 4,571,210, Cl. 446-424.000.

Meyer, Danny S.: *See—*
Diehl, Robert J.; Hollister, F. Harold; and Meyer, Danny S., 4,570,942, Cl. 277-12.000.

Meyer, David L.; and Wolfe, Brian A., to AMP Incorporated. Cable harness assembly apparatus. 4,570,326, Cl. 29-566.300.

Meyer, Thomas N.: *See—*
Fey, Maurice G.; Fatum, John H.; and Meyer, Thomas N., 4,571,259, Cl. 75-10.00R.

Meyn, Pieter. Apparatus for separating the gizzards from the entrails of poultry and for further processing the gizzards. 4,570,294, Cl. 17-11.000.

MI Medical & Scientific Instruments, Inc.: *See—*
Gnerlich, Hans R.; and Zimmermann, Kuno P., 4,571,556, Cl. 331-78.000.

Mich, Thomas F.: *See—*
Hutt, Marland P.; Mich, Thomas F.; and Culbertson, Townley P., 4,571,396, Cl. 514-249.000.

Michiels, Hugo R. Racket with knotting blocks for mounting strings. 4,570,933, Cl. 273-73.00D.

Michigan Instruments, Inc.: *See—*
Barkalow, Clare E., 4,570,615, Cl. 128-28.000.

Michioka, Ryo: *See—*
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.

Microband Corporation of America: *See—*
Dalimonte, Alfred A.; and Fung, Paul J., 4,571,621, Cl. 358-186.000.

Midthun, Karen: *See—*
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.
Miele, Angelo M. Umbrella holder for golf cart. 4,570,894, Cl. 248-534.000.
Mihara, Yuji: *See—*
Noguchi, Yasuhiro; and Mihara, Yuji, 4,571,380, Cl. 430-589.000.
Miki, Atsushi; Mori, Etsunori; Hoshi, Minoru; and Higaki, Masaru, to Hitachi, Ltd. Winding for static induction apparatus. 4,571,570, Cl. 336-70.000.
Mileos, George: *See—*
Ferrante, Joseph G.; Victoria, Henry J.; and Mileos, George, 4,571,340, Cl. 426-393.000.
Miles Laboratories, Inc.: *See—*
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,571,405, Cl. 514-437.000.
Elliott, Roderick D.; and Gardiner, Phillip J., 4,570,630, Cl. 128-203.150.
Miller, Cardell E.: *See—*
Waldo, Russell W.; Miller, Cardell E.; Huot, Louis D.; and Engstrom, George L., 4,570,985, Cl. 292-262.000.
Miller, Gregory D.: *See—*
Kijowski, John; and Miller, Gregory D., 4,571,321, Cl. 264-43.000.
Miller, Hyman: *See—*
Thwaites, John A.; Miller, Hyman; and Ferrara, Ronald A., 4,570,780, Cl. 198-781.000.
Miller, Kevin P.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,343, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,344, Cl. 426-535.000.
Miller, Roy W.; and Kunst, Robert J., to Pullman Standard Inc. Railway car underframe. 4,570,807, Cl. 213-60.000.
Miller, Walter, to Dr. Johannes Heidenhain GmbH. Sealing arrangement for incapsulated measuring instrument. 4,570,347, Cl. 33-125.00R.
Mimura, Yoshiki: *See—*
Arai, Tetsuji; and Mimura, Yoshiki, 4,571,486, Cl. 219-354.000.
Minamida, Hisatsugu; Kato, Akira; Sawayama, Isamu; and Tanaka, Ken-ichi, to Takeda Chemical Industries, Ltd. Aqueous adhesive compositions. 4,571,412, Cl. 524-64.000.
Minnebraker, Jeffrey P.; and Linder, George E., to Quadra Wheelchairs, Inc. Brake device for wheelchairs. 4,570,756, Cl. 188-2.00F.
Minnesota Mining and Manufacturing Company: *See—*
Bruns, Carl H., deceased, 4,570,516, Cl. 83-455.000.
Huss, Charles P., 4,571,059, Cl. 355-3.0TR.
Mahmoodi, A. B.; and Nelson, Owen L., 4,571,635, Cl. 358-284.000.
Musser, Arlene K.; and Koelsch, Peter M., 4,571,373, Cl. 430-143.000.
Schoon, David J., 4,571,623, Cl. 358-208.000.
Vikesland, John P., 4,571,374, Cl. 430-156.000.
Minolta Camera Kabushiki Kaisha: *See—*
Hayashi, Masamichi; and Tokura, Yukio, 4,571,064, Cl. 355-8.000.
Kobayashi, Haruo; and Ueda, Hiroshi, 4,571,043, Cl. 354-121.000.
Minoura, Kazuo; and Tateoka, Masamichi, to Canon Kabushiki Kaisha. Plural-beam scanning apparatus. 4,571,021, Cl. 350-6.800.
Minter, Mearl, to Rolscreen Company. Weather seal for frame and movable panel assembly. 4,570,393, Cl. 52-72.000.
Mintz, Daniel. Load carrier frame. 4,570,954, Cl. 280-5.240.
Miodownik, Saul, to Memorial Hospital for Cancer and Allied Diseases. Discontinuity detector. 4,570,639, Cl. 128-718.000.
Mirsberger, Peter: *See—*
Holik, Herbert; Hund, Helmut; and Mirsberger, Peter, 4,570,314, Cl. 29-113.00R.
Mita, Hideo: *See—*
Ishibashi, Kiyoshi; Ukai, Yujiro; Mita, Hideo; and Shiroshita, Yoshihira, 4,570,445, Cl. 62-6.000.
Mita Industrial Company Limited: *See—*
Kimura, Shigeki; Ikuta, Yoshihisa; and Nakajima, Yoshihiro, 4,571,069, Cl. 355-14.00R.
Nishimura, Kouzou; and Iida, Kazumi, 4,570,768, Cl. 192-35.000.
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.
Mitani, Sotozi: *See—*
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Mitchell, Ron: *See—*
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Mitsubishi Denki Kabushiki Kaisha: *See—*
Arai, Junichi, 4,571,019, Cl. 339-276.00R.
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,570,583, Cl. 123-179.00K.
Hirayama, Mitsunori; and Yamanaka, Kimio, 4,571,677, Cl. 364-200.000.
Kumatani, Hiroshi, 4,570,767, Cl. 192-18.00B.
Maeda, Susumu; Taki, Masakazu; and Yoshizawa, Kenji, 4,571,479, Cl. 219-124.340.
Ohta, Kazutoshi; and Suzuki, Katsuhiko, 4,570,753, Cl. 187-1.00R.
Tobita, Youichi, 4,571,503, Cl. 307-269.000.
Tobita, Youichi, 4,571,509, Cl. 307-443.000.
Mitsuboshi Belting Ltd.: *See—*
Kazusa, Susumu; Okamoto, Harunori; and Fukuchi, Eiji, 4,570,689, Cl. 152-209.00R.
Takano, Hiroshi, 4,571,217, Cl. 474-46.000.
Mitsuda, Satoshi: *See—*
Umemura, Takeaki; Inoue, Ayumu; and Mitsuda, Satoshi, 4,571,436, Cl. 568-354.000.
Mitsui & Co., Ltd.: *See—*
Matsubara, Yutaka; Konno, Hisao; and Sasai, Takashi, 4,570,446, Cl. 62-48.000.
Mitsui Engineering and Shipbuilding Company, Limited: *See—*
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,571,125, Cl. 405-224.000.
Mitsumatsu, Yoshio; Kamio, Akio; Seike, Shoji; and Nozaki, Masayuki, to Chubu Electric Co., Mitsubishi Denki Kabushiki Kaisha & NGK Insulators, Inc. Lightning arrester insulator. 4,571,660, Cl. 361-127.000.
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, to Fujitsu Limited. Ultrasonic sector-scan probe. 4,570,488, Cl. 73-626.000.
Miwa, Kishio; Nagaoka, Yukiko; and Inoue, Takehisa, to Toray Industries, Inc. Process for separation of substituted benzene isomers. 4,571,441, Cl. 570-211.000.
Mix, Konrad: *See—*
Buhler, Ulrich; Stahl, Theo; Mix, Konrad; and Roth, Kurt, 4,571,246, Cl. 8-456.000.
Miyahara, Masaaki: *See—*
Shima, Yoshiharu; Miyahara, Masaaki; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,571,169, Cl. 425-451.900.
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Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
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Mizoguchi, Hakaru; Egawa, Akira; and Okamoto, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Cross flow type laser devices. 4,571,730, Cl. 372-58.000.
Mizokami, Kazunori: *See—*
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.
Mizumoto, Yasuharu: *See—*
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Mobay Chemical Corporation: *See—*
Yeater, Robert P., 4,571,304, Cl. 252-182.000.
Mobil Oil Corporation: *See—*
Benoit, Gordon L., 4,571,235, Cl. 493-195.000.
Herrington, Fox J., 4,570,411, Cl. 53-117.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,571,248, Cl. 44-53.000.
Stowe, Lawrence R., 4,570,710, Cl. 166-250.000.
Modern Machine Works Inc.: *See—*
Lengenfelder, William G., Jr.; and Barbie, Paul E., 4,571,225, Cl. 474-176.000.
Moeller, Raymond J.: *See—*
Jarzombek, Richard E.; and Moeller, Raymond J., 4,571,416, Cl. 524-474.000.
Moggridge, William G.: *See—*
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.
Mohs, Thomas J.: *See—*
Borst, Rodney D.; and Mohs, Thomas J., 4,570,818, Cl. 220-339.000.
Mohtai, Tsuneaki: *See—*
Takaoka, Michio; Mohtai, Tsuneaki; Yoshida, Syotaroh; and Watanabe, Kazuo, 4,571,453, Cl. 174-110.00A.
Moksvold, Tor W., to International Business Machines Corporation. Method for minimizing autodoping during epitaxial deposition utilizing a graded pattern subcollector. 4,571,275, Cl. 148-175.000.
Molex Incorporated: *See—*
Bassler, Max; and Dambach, Philip J., 4,571,012, Cl. 339-14.00R.
Molins PLC: *See—*
Ahern, Ronald A.; Dyett, Derek H.; Labbe, Francis A. M.; and Wood, Godfrey A., 4,570,644, Cl. 131-109.00R.
Molloy, Edward W., to General Motors Corporation. Automatic belt tensioner. 4,571,223, Cl. 474-133.000.
Molloy, Edward W.; and Richard, Raymond L., Jr., to General Motors Corporation. Moldable plastic pulley. 4,571,226, Cl. 474-190.000.
Molly Maguire, Inc.: *See—*
Goodwin, John D.; and Mulkey, Forrest W., III, 4,571,389, Cl. 501-85.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Light measuring device for camera. 4,571,050, Cl. 354-429.000.
Montreuil, Albert H.; and Montreuil, Beverly A. Fastener for disposable waste container liners. 4,570,304, Cl. 24-30.50S.
Montreuil, Beverly A.: *See—*
Montreuil, Albert H.; and Montreuil, Beverly A., 4,570,304, Cl. 24-30.50S.
Mooney, Paul C. Locking mechanism for tripod and spreader legs. 4,570,886, Cl. 248-186.000.

Moore, Alan F., to Dunlop Limited. Flexible joint means. 4,570,979, Cl. 285-223.000.

Moore, Thomas W.: *See*—
Stowers, Jeffery P.; and Moore, Thomas W., 4,571,540, Cl. 324-158.00P.

Morand, Pierre, to Technigaz. Fluid-tight connecting structure and storage tank in particular for a molten salt, fitted with said structure. 4,570,815, Cl. 220-75.000.

Morawski, Lawrence V.: *See*—
Morawski, Longine V.; and Morawski, Lawrence V., 4,570,949, Cl. 279-1.0DA.
Morawski, Longine V.; and Morawski, Lawrence V., 4,570,950, Cl. 279-1.0DJ.

Morawski, Longine V.; and Morawski, Lawrence V. Chuck. 4,570,949, Cl. 279-1.0DA.

Morawski, Longine V.; and Morawski, Lawrence V. Compensating chuck. 4,570,950, Cl. 279-1.0DJ.

Morenilla, Luis: *See*—
Robbins, Clyde; and Morenilla, Luis, 4,571,615, Cl. 358-120.000.

Morgan, Gregory L.: *See*—
Sullivan, Timothy A.; and Morgan, Gregory L., 4,571,251, Cl. 65-12.000.

Morgrey, Richard T. Mailbox signalling device. 4,570,846, Cl. 232-35.000.

Mori, Etsunori: *See*—
Miki, Atsushi; Mori, Etsunori; Hoshi, Minoru; and Higaki, Masaru, 4,571,570, Cl. 336-70.000.

Mori, Takasuke; Miyazaki, Jun; and Nakata, Hitoshi, to Kabushiki Kaisha Kobe Seiko Sho. Method of treating final continuous cast strand in a horizontal continuous casting process. 4,570,697, Cl. 164-484.000.

Morimoto, Kiyoshi; and Watanabe, Hiroshi, to Futaba Denshi Kogyo K.K. Fluorescent display device. 4,571,523, Cl. 313-497.000.

Morinaga Milk Industry Co., Ltd.: *See*—
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, 4,571,338, Cl. 426-324.000.

Morishita, Akira: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,570,583, Cl. 123-179.00K.

Morishita, Koji: *See*—
Suzuki, Setsuo; Morishita, Koji; and Sakamoto, Yushi, 4,571,314, Cl. 264-1.700.

Morita, Richard Y.; and Jones, Ronald D., to State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University. Methane production. 4,571,384, Cl. 435-167.000.

Moritz, Werner, to Kahelschlepp Gesellschaft mit beschrankter Haftung. Energy conductor chain. 4,570,437, Cl. 59-78.100.

Moriwaki, Masayoshi: *See*—
Oishi, Kengo; and Moriwaki, Masayoshi, 4,570,877, Cl. 242-199.000.

Morris, Frank E.: *See*—
Dudro, Harry R., Jr.; and Morris, Frank E., 4,571,318, Cl. 264-30.000.

Morris Rod Weeder Co. Ltd.: *See*—
Machnee, Cecil B., 4,570,491, Cl. 73-861.000.

Morrison, Elden R., to Ricoh Company, Ltd. Electrophotographic copying apparatus including method of formation of toner transport grid used as a part of drum cleaning system. 4,571,066, Cl. 355-15.000.

Morrison, Thomas E., to B. F. Goodrich Company, The. Conveyor pulley. 4,570,786, Cl. 198-842.000.

Morton Thiokol. Inc.: *See*—
Bell, Frank H., 4,570,540, Cl. 102-202.000.

Moseley, John F.; and Austin, Stephen R., to Superior Handling Equipment, Inc. Self-propelled freight handling truck. 4,571,139, Cl. 414-347.000.

Mostek Corporation: *See*—
Davis, Harold L., 4,571,708, Cl. 365-203.000.

Motomak Motorenbau, Machinen-und Werkzeugfabrik Konstruktionen GmbH: *See*—
Speil, Walter, 4,570,582, Cl. 123-90.460.

Motorola, Inc.: *See*—
Gay, Michael J.; and Gutmann, Johannes, 4,571,558, Cl. 331-105.000.
Nelson, Robert N.; Olds, Keith A.; and White, Scott C., 4,571,514, Cl. 307-234.000.
Phillips, James P.; and Kazecki, Henry L., 4,571,595, Cl. 343-745.000.
Price, J. B.; Tobin, Philip J.; Pintchovski, Fabio; and Seelbach, Christian A., 4,570,328, Cl. 29-571.000.
Sigmon, Bernard E.; and Evans, Charles V., 4,571,555, Cl. 331-56.000.

Motosko, Stephen J., II. Vegetable slicer with thickness adjustment. 4,570,519, Cl. 83-856.000.

Motosugi, Takanori; and Sakai, Hisashi, to Ricoh Company, Ltd. Thermosensitive recording material. 4,571,605, Cl. 346-216.000.

Mourier, Georges, to Thomson-CSF. Electron accelerator and a millimeter-wave and submillimeter-wave generator equipped with said accelerator. 4,571,524, Cl. 315-4.000.

Moyer, Gary V.: *See*—
Chapman, Richard E.; and Moyer, Gary V., 4,570,752, Cl. 182-155.000.

MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH.: *See*—
Deutschmann, Herbert; Haussmann, Gerhard; and Kamleitner, Ewald, 4,570,442, Cl. 60-612.000.

Mucheyer, Norbert, to Mannesmann Rexroth GmbH. Electric circuit for controlling a tractor-pulled mounted device adjustable in height by a hydraulic jack. 4,571,500, Cl. 307-154.000.

Muckle, Alexander M.: *See*—
Mathews, Harlan P.; Romano, Paul; and Muckle, Alexander M., 4,571,714, Cl. 369-44.000.

Mueller, Arthur L., to AMP Incorporated. Electrical connector having rotating clamps for securing electronic packages therein. 4,571,015, Cl. 339-17.0CF.

Mueller, Claus D.: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Mueller, Josef: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Mukai, Yoshiaki; and Ueno, Iwao, to Mazda Motor Corporation. Vehicle suspension system. 4,570,968, Cl. 280-664.000.

Mukamal, Harold: *See*—
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., 4,571,365, Cl. 428-412.000.

Mulholland, James A.: *See*—
Derbidge, T. Craig; Mulholland, James A.; and Foster, Edward P., 4,570,551, Cl. 110-263.000.

Mulkey, Forrest W., III: *See*—
Goodwin, John D.; and Mulkey, Forrest W., III, 4,571,389, Cl. 501-85.000.

Mullally, Charles J., to Sealed Power Corporation. Solenoid valve. 4,570,904, Cl. 251-129.210.

Muller, Johann: *See*—
Hockemeyer, Friedrich; John, Peter; Muller, Johann; and Preiner, Gerhard, 4,571,349, Cl. 427-54.100.

Muller, Wolfgang H. E.; Boxkes, Werner; and Scholten, Heinz, to Chemische Werke Huls Aktiengesellschaft. Dehydrating 2,6-dimethylmorpholine. 4,571,284, Cl. 203-14.000.

Mumpower, Robert C.: *See*—
Henry, James W.; and Mumpower, Robert C., 4,571,497, Cl. 250-560.000.

Munakata, Kiyohiko: *See*—
Tanizaki, Hiroyuki; Sato, Kazuma; Munakata, Kiyohiko; and Kanazawa, Yuzo, 4,570,997, Cl. 297-349.000.

Munetsugu, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic operation apparatus using solar cells. 4,571,690, Cl. 364-483.000.

Murakami, Hitomi: *See*—
Hatori, Yoshinori; Murakami, Hitomi; and Matsumoto, Shuichi, 4,571,618, Cl. 358-136.000.

Murakami, Katsushi, to Kabushiki Kaisha Bandai. Wrist watch type container for toy robot or the like. 4,571,199, Cl. 446-73.000.

Murakami, Katsushi, to Kabushiki Kaisha Bandai. Form-convertible toy robot. 4,571,203, Cl. 446-95.000.

Murakami, Masahiro: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.

Murakami, Takashi: *See*—
Yoshida, Kazuhiro; and Murakami, Takashi, 4,570,441, Cl. 60-421.000.

Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,343, Cl. 426-535.000.
Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,344, Cl. 426-535.000.

Muramoto, Masahiro: *See*—
Takayama, Masaharu; Taniguchi, Seiichi; Enomoto, Masayasu; and Muramoto, Masahiro, 4,571,383, Cl. 435-25.000.

Murata Kikai Kabushiki Kaisha: *See*—
Kawarabashi, Tsukasa; and Takahashi, Shinji, 4,570,865, Cl. 242-35.50A.

Murata Manufacturing Co., Ltd.: *See*—
Fujiki, Yasuo; and Hori, Toshio, 4,571,561, Cl. 333-184.000.
Kawabata, Akira; Shiosaki, Tadashi; Takeda, Fumio; Fujishima, Satoru; and Ieki, Hideharu, 4,571,519, Cl. 310-313.00A.
Murata, Michihiro; and Kumada, Akira, 4,570,482, Cl. 73-290.00V.

Murata, Michihiro; and Kumada, Akira, to Murata Manufacturing Co., Ltd. Load-sensitive level detecting device. 4,570,482, Cl. 73-290.00V.

Murata, Shinichi: *See*—
Ishii, Takashi; Murata, Shinichi; Kusagawa, Shiro; and Wakasaki, Miyoshi, 4,570,695, Cl. 164-463.000.

Murata, Yoshinori, to Mazda Motor Corporation. Rotor housing for rotary piston engines. 4,571,165, Cl. 418-178.000.

Murawski, Peter; and Mayer, Wolfgang, to Siemens Aktiengesellschaft. Method and circuit arrangement for providing date and time information in a telex and data switching system. 4,570,565, Cl. 178-2.00R.

Murayama, Naohiro: *See*—
Sakagami, Teruo; Shoji, Masuhiro; Arakawa, Noriyuki; and Murayama, Naohiro, 4,571,390, Cl. 502-402.000.

Murphy, Betty J., to Creative Products Resource Associates, Ltd. Resealable dispensing container for folded towels. 4,570,820, Cl. 221-34.000.
Murphy, Michael E. Printer stand. 4,570,802, Cl. 211-13.000.
Murphy, Richard D.: *See*—
Fontenot, John E.; and Murphy, Richard D., 4,570,480, Cl. 73-155.000.
Muschelknautz, Edgar: *See*—
Kerschner, Engelbert; and Muschelknautz, Edgar, 4,570,287, Cl. 15-346.000.
Musser, Arlene K.; and Koelsch, Peter M., to Minnesota Mining and Manufacturing Company. Exposure latitude improvement in printing positive-acting color pre-press proofs. 4,571,373, Cl. 430-143.000.
Muto, Yoshiyuki; and Etani, Tadao, to Japan Tobacco & Salt Public Corporation, The. Oil sealing bearing for axially reciprocating shaft. 4,571,011, Cl. 308-3.500.
Mutschall, Hugo: *See*—
Focke, Heinz; and Mutschall, Hugo, 4,570,421, Cl. 53-491.000.
Nagahira, Jyoji: *See*—
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, 4,571,725, Cl. 371-25.000.
Nagai, Toshinari: *See*—
Kawai, Taiyo; Nakagawa, Norihisa; Kayanuma, Nobuaki; and Nagai, Toshinari, 4,570,590, Cl. 123-308.000.
Nagai, Yasuhiro: *See*—
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, 4,571,480, Cl. 219-146.300.
Nagamori, Kazuo: *See*—
Saigo, Hiroshi; and Nagamori, Kazuo, 4,571,208, Cl. 446-353.000.
Nagano Prefecture: *See*—
Okubo, Keigo; Toba, Shoji; and Kumagai, Tokuo, 4,571,287, Cl. 204-37.600.
Nagano, Yosisuke: *See*—
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.
Nagaoka, Yukiko: *See*—
Miwa, Kishio; Nagaoka, Yukiko; and Inoue, Takehisa, 4,571,441, Cl. 570-211.000.
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, to Canon Kabushiki Kaisha. Image formation apparatus having a diagnosing function. 4,571,725, Cl. 371-25.000.
Nagashima, Yoshitake, to Tokyo Shibaura Denki Kabushiki Kaisha. Dropout compensation circuit for a video reproducing system. 4,571,639, Cl. 358-314.000.
Nagda, Jagdish M.: *See*—
Herzog, Alexander; Honomichl, Larry L.; Nagda, Jagdish M.; and Rehage, Teddy A., 4,571,699, Cl. 364-900.000.
Nakadate, Takanori: *See*—
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.
Nakagawa, Norihisa: *See*—
Kawai, Taiyo; Nakagawa, Norihisa; Kayanuma, Nobuaki; and Nagai, Toshinari, 4,570,590, Cl. 123-308.000.
Nakagomi, Shoji. Hopper drier. 4,570,360, Cl. 34-80.000.
Nakahama, Ryoji: *See*—
Iwashita, Takashi; Suzuki, Hideo; and Nakahama, Ryoji, 4,570,776, Cl. 192-114.00R.
Nakahara, Tohru: *See*—
Uno, Kinichi; and Nakahara, Tohru, 4,571,461, Cl. 179-81.00B.
Nakajima, Hideki, to Shimano Industrial Company Limited. Clutch and brake for a fishing reel. 4,570,878, Cl. 242-220.000.
Nakajima, Yoshihiro: *See*—
Kimura, Shigeki; Ikuta, Yoshihisa; and Nakajima, Yoshihiro, 4,571,069, Cl. 355-14.00R.
Nakamura, Karl S.: *See*—
Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., 4,571,456, Cl. 179-2.00C.
Nakamura, Kazuo: *See*—
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.
Nakamura, Kousuke: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Ohkoshi, Tokio, 4,571,610, Cl. 357-67.000.
Nakamura, Nobuyuki: *See*—
Shima, Yoshiharu; Miyahara, Masaaki; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,571,169, Cl. 425-451.900.
Nakamura, Shigeru: *See*—
Harada, Toru; Hirano, Shigeo; Nakamura, Shigeru; and Shimamura, Isao, 4,571,376, Cl. 430-218.000.
Nakamura, Teruo: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,571,164, Cl. 418-76.000.
Nakamura, Toru, to Olympus Optical Co., Ltd. Lens system for optical recording type disks. 4,571,034, Cl. 350-432.000.
Nakanishi, Tsugio: *See*—
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.
Nakano, Manabu: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Nakano, Takao; and Tochimori, Shigemitsu, to Nitta Beluto Kabushikikaisha. Wrapping transmission. 4,571,220, Cl. 474-100.000.
Nakashima, Yutaka: *See*—
Sato, Nobuhiro; Okada, Akira; and Nakashima, Yutaka, 4,571,362, Cl. 428-329.000.
Nakata, Hitoshi: *See*—
Mori, Takasuke; Miyazaki, Jun; and Nakata, Hitoshi, 4,570,697, Cl. 164-484.000.
Nakayama, Yoshiaki; and Kiuchi, Takao, to Fuji Photo Film Co., Ltd. Disk film projector. 4,571,042, Cl. 353-110.000.
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, to Fujikura Ltd. Oxygen sensor for and method of determining concentration of oxygen. 4,571,285, Cl. 204-1.00T.
Namiki, Yasuomi, to Victor Company of Japan Limited. VTR Circuit arrangement for recording index signal. 4,571,643, Cl. 360-66.000.
Narita, Hitoshi: *See*—
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,571,125, Cl. 405-224.000.
Nartron Corporation: *See*—
Taylor, Robert E., 4,571,537, Cl. 323-326.000.
Naruse, Yasuhito; and Inukai, Yuzo, to Fuji Photo Film Co., Ltd. Methods of forming multilayer coated film. 4,571,316, Cl. 264-22.000.
Nash, John E., to Syntex (U.S.A.) Inc. Vibratory endodontic device. 4,571,183, Cl. 433-116.000.
National Refractories & Minerals Corporation: *See*—
Geisler, Thomas A., 4,570,910, Cl. 266-284.000.
National Research Development Corporation: *See*—
Caswell, Kennith, 4,570,965, Cl. 280-426.000.
Drazan, Pavel J., 4,571,148, Cl. 414-730.000.
Harris, John D.; and Evans, Mervyn, 4,570,625, Cl. 128-92.00G.
Perry, Forbes G. B., 4,570,501, Cl. 74-200.000.
Nausedas, Joseph A., to Union Carbide Corporation. Casing article. 4,570,300, Cl. 17-49.000.
Nausedas, Joseph A.: *See*—
Beckman, John H.; and Nausedas, Joseph A., 4,570,301, Cl. 17-49.000.
Nawa, Motoyuki: *See*—
Sugawara, Norio; and Nawa, Motoyuki, 4,570,533, Cl. 98-40.240.
Neal, Richard M. Surgical drape. 4,570,628, Cl. 128-132.00D.
NEC Corporation: *See*—
Kamoshida, Mototaka, 4,571,685, Cl. 364-468.000.
Nishitani, Takao; Kuroda, Ichiro; and Kato, Tadaharu, 4,571,737, Cl. 375-27.000.
Takeo, Seiji; and Amari, Akira, 4,571,103, Cl. 400-616.200.
Teshima, Shoichi, 4,571,601, Cl. 346-140.00R.
Uno, Kinichi; and Nakahara, Tohru, 4,571,461, Cl. 179-81.00B.
Watanabe, Takayuki, 4,571,707, Cl. 365-200.000.
Neff, Dale A.: *See*—
Schell, James E., deceased; Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., 4,571,291, Cl. 204-213.000.
Neidell, Norman S.; and Cook, Ernest E. Seismic method for identifying low velocity subsurface zones. 4,571,710, Cl. 367-38.000.
Neilsen, Hildaur L. Key retaining device. 4,570,469, Cl. 70-389.000.
Neiman S.A.: *See*—
Bemm, Wulf; Bruckner, Rolf; and Eigelshofen, Gunter, 4,570,468, Cl. 70-252.000.
Nelson, Owen L.: *See*—
Mahmoodi, A. B.; and Nelson, Owen L., 4,571,635, Cl. 358-284.000.
Nelson, Robert N.; Olds, Keith A.; and White, Scott C., to Motorola, Inc. Amplitude adjusted pulse width discriminator and method therefor. 4,571,514, Cl. 307-234.000.
Nelson, William E.: *See*—
Hornbeck, Larry J.; Nelson, William E.; and Carlo, James T., 4,571,603, Cl. 346-160.000.
Nestlen, Wolfgang; and Scheffler, Michael, to Hengstler GmbH Geschaftsbereich, Haller-Relais. Electromagnetic relay. 4,571,567, Cl. 335-128.000.
Neuman, Grover H.: *See*—
Emry, Carl A., Jr.; Neuman, Grover H.; Mersiovsky, Lynda K.; and Pfeuffer, Margaret S., 4,571,700, Cl. 364-900.000.
Nevins, Norman; and Gustafson, Thomas L., to Magic Seal Corporation. Caulking composition. 4,571,410, Cl. 523-122.000.
Newberry, Michael E.: *See*—
Matlach, William J.; Newberry, Michael E.; and Thierheimer, Charles L., Jr., 4,570,656, Cl. 137-13.000.
Newcom, William F.; and Spinelli, Bartel L. Method for automatic operation of an accumulator. 4,570,783, Cl. 198-347.000.
Newell Mfg. Co., a Division of Citation-Walthers Co.: *See*—
Suess, Jack E., 4,570,382, Cl. 49-430.000.
Newman, Paul D.: *See*—
Newman, William E., Sr.; and Newman, Paul D., 4,570,645, Cl. 131-175.000.
Newman, William E., Sr.; and Newman, Paul D. Safety holder for cigarettes. 4,570,645, Cl. 131-175.000.
News Log International, Inc.: *See*—
Ackerman, Richard; Hurlbut, Donovan H.; and Jewer, Alan A., 4,571,713, Cl. 369-44.000.
Newsome, Reginald W.: *See*—
Nichols, Walter A.; and Newsome, Reginald W., 4,570,649, Cl. 131-336.000.
Newton, Jean M.: *See*—
Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., 4,571,197, Cl. 446-6.000.

NGK Spark Plug Co., Ltd.: *See*—
Sobue, Hideo, 4,570,483, Cl. 73-290.00V.
Nichols, Frederick W., III: *See*—
Reichel, Kenneth; Nichols, Frederick W., III; and Levenstein, Norm, 4,571,717, Cl. 369-256.000.
Nichols, Walter A.; and Newsome, Reginald W., to Philip Morris Incorporated. Filter cigarette. 4,570,649, Cl. 131-336.000.
Nicholson, Michael A.; and Kosmanski, Thomas J., to General Motors Corporation. Multi-stroke parking brake variable ratio apply and release mechanism. 4,570,508, Cl. 74-535.000.
Nickolay, Helmut, to Zinser Textilmaschinen GmbH. Yarn end blowing nozzle. 4,570,433, Cl. 57-305.000.
Nielsen, Donald R., to PPG Industries, Inc. Subsituted phenoxybenzisoxazole herbicides. 4,571,255, Cl. 71-88.000.
Nieratschker, Willi: *See*—
Peschka, Walter; Schneider, Gottfried; and Nieratschker, Willi, 4,570,578, Cl. 123-1.00A.
Niewald, Jack L.; and Kelch, Eugene W. Mechanism for lifting vehicle tires. 4,571,142, Cl. 414-427.000.
Nighswonger, Lester L., to Deere & Company. Differential lock control system responsive to steering and/or braking action to unlock differential. 4,570,509, Cl. 74-710.500.
Nihei, Ryo: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,571,694, Cl. 364-513.000.
Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 4,570,569, Cl. 118-410.000.
Nihon Tokusan Kabushiki Kaisha: *See*—
Hashizume, Takeshi; and Onoda, Hiroshi, 4,571,434, Cl. 564-103.000.
Niihara, Toshio: *See*—
Ojima, Masahiro; Niihara, Toshio; and Fujiwara, Hideo, 4,571,650, Cl. 360-114.000.
Niino, Yasuo: *See*—
Unno, Kunihiko; Tsujiuchi, Toshio; and Niino, Yasuo, 4,570,386, Cl. 51-165.710.
Nijhuis, Gerrit J., to Machinefabriek G.J. Nijhuis B.V. Scraper block for an unhairing machine. 4,570,297, Cl. 17-16.000.
Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,571,213, Cl. 446-468.000.
Nikolov, Valentin A.; Klissurski, Dimiter G.; and Jurov, Boyan M., to Stopanski chimitcheski Kombinat "Gavril Genov", Russe. Reactor for conducting high exothermic and endothermic catalytic processes. 4,571,325, Cl. 422-191.000.
Niles Parts Co., Ltd.: *See*—
Hattori, Yoshio, 4,571,470, Cl. 200-61.540.
Nilsson, Sten V., to Telefonaktiebolaget LM Ericsson. D.C-D.C. converter for converting an unstabilized D.C.-voltage to three stabilized D.C.-voltages. 4,571,666, Cl. 363-15.000.
Nippon Air Brake Co., Ltd.: *See*—
Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, 4,571,006, Cl. 303-6.00C.
Nippon Electric Co., Ltd.: *See*—
Kimura, Tadakatsu; Makabe, Takayoshi; and Kuraishi, Yoshiaki, 4,571,502, Cl. 307-262.000.
Watanabe, Takao, 4,571,697, Cl. 364-561.000.
Nippon Electronic Co., Ltd.: *See*—
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Futamase, Tsuyoshi; and Kato, Mitsumi, 4,570,523, Cl. 84-1.240.
Suzuki, Shigeo, 4,570,525, Cl. 84-410.000.
Yokoyama, Kenji, 4,571,553, Cl. 330-149.000.
Nippon Kagaku K.K.: *See*—
Uematsu, Kimio, 4,571,045, Cl. 354-245.000.
Nippon Kogaku K.K.: *See*—
Kazami, Kazuyuki, 4,571,051, Cl. 354-468.000.
Wakabayashi, Hiroshi, 4,571,044, Cl. 354-173.110.
Nippon Kokan Kabushiki Kaisha: *See*—
Kamio, Hiroshi; Ueno, Yasushi; Noguchi, Takao; Kunioka, Kazuo; and Fukuda, Shuzo, 4,570,453, Cl. 62-375.000.
Nippon Notion Kogyo Co., Ltd.: *See*—
Kanzaka, Yoshihiro, 4,570,307, Cl. 24-95.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,570,316, Cl. 29-156.80R.
Tsuchiya, Takeshi; and Samejima, Shuji, 4,570,946, Cl. 277-216.000.
Nippon Shoji Kaisha, Ltd.: *See*—
Takayama, Masaharu; Taniguchi, Seiichi; Enomoto, Masayasu; and Muramoto, Masahiro, 4,571,383, Cl. 435-25.000.
Nippon Soken, Inc.: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; and Saito, Tsutomu, 4,570,594, Cl. 123-414.000.
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.
Nippon Telecommunication Engineering Company: *See*—
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, 4,571,101, Cl. 400-124.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kato, Kikuji; Watabe, Akinori; Ukita, Hiroo; and Yonezawa, Susumu, 4,571,715, Cl. 369-45.000.
Kimura, Tadakatsu; Makabe, Takayoshi; and Kuraishi, Yoshiaki, 4,571,502, Cl. 307-262.000.
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
Nippondenso Co., Ltd.: *See*—
Ito, Masaki; and Yamazoe, Hiroshi, 4,570,601, Cl. 123-468.000.
Ohara, Toshio; Fukumi, Sigenobu; and Yamauchi, Yoshiyuki, 4,570,700, Cl. 165-134.100.
Takanabe, Kazunori; Yamamoto, Masaki; Ito, Kenzo; and Fujinami, Hiroshi, 4,571,684, Cl. 364-449.000.
Takemi, Akio; Yoshimi, Akiro; and Kawai, Takayoshi, 4,570,450, Cl. 62-199.000.
Nirasawa, Mitsuharu: *See*—
Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,571,293, Cl. 204-418.000.
Nishibori, Toshiki, to Sharp Kabushiki Kaisha. Sheet paper attracting system. 4,570,920, Cl. 271-107.000.
Nishikawa, Masao; Sakai, Shinzo; and Aoki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Control system for automatic transmissions for vehicles. 4,570,770, Cl. 192-0.052.
Nishiki, Masayuki; and Rifu, Toshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Multi-channel radiation detector array. 4,571,494, Cl. 250-370.000.
Nishimura, Kouzou; and Iida, Kazumi, to Mita Industrial Co., Ltd. Electromagnetically controlled spring clutch mechanism. 4,570,768, Cl. 192-35.000.
Nishimura, Sadanori; and Maezono, Masakazu, to Honda Giken Kogyo Kabushiki Kaisha. Control system for hydraulic transmission. 4,570,511, Cl. 74-867.000.
Nishimura, Sadanori, to Honda Giken Kogyo Kabushiki Kaisha. Damper apparatus in clutch for torque convertor. 4,570,764, Cl. 192-3.290.
Nishimura, Youji: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,570,583, Cl. 123-179.00K.
Nishimura, Yuji: *See*—
Kawaguchi, Teruhiko; and Nishimura, Yuji, 4,570,975, Cl. 280-806.000.
Nishio, Shigeru; and Hashimoto, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Lumbar support air valve assembly. 4,570,676, Cl. 137-870.000.
Nishitani, Takao; Kuroda, Ichiro; and Kato, Tadaharu, to NEC Corporation. Adaptive differential pulse code modulation decoding circuit. 4,571,737, Cl. 375-27.000.
Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Transport item detecting arrangement. 4,571,055, Cl. 355-3.0SH.
Nishiyama, Haruo, to Sharp Kabushiki Kaisha. Detecting device for optical scanning system position suitable for electrophotographic copying machine. 4,571,067, Cl. 355-14.0SH.
Nishizawa, Jun-ichi; and Suto, Ken, to Zaidan Hojin Handotai Kenkyu Shinkokai. Far-infrared electromagnetic wave generator. 4,571,727, Cl. 372-4.000.
Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, to Fuji Film Co.; and Junichi Nishizawa. Two-dimensional solid-state image sensor device. 4,571,624, Cl. 358-212.000.
Nissan Chemical Industries: *See*—
Taniguchi, Masakazu; Baba, Masatoshi; Ochiai, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, 4,571,397, Cl. 514-252.000.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,570,585, Cl. 123-188.00S.
Hayashi, Yoshimasa, 4,570,945, Cl. 277-197.000.
Hirano, Yoshinori, 4,570,579, Cl. 123-41.020.
Hoshino, Shigeo, 4,571,661, Cl. 361-283.000.
Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, 4,571,006, Cl. 303-6.00C.
Tanaka, Hiroshi; Mitani, Sotozi; and Sakurai, Yasushi, 4,570,474, Cl. 72-411.000.
Tanizaki, Hiroyuki; Sato, Kazuma; Munakata, Kiyohiko; and Kanazawa, Yuzo, 4,570,997, Cl. 297-349.000.
Tsujimura, Harutoshi; and Kamijo, Ken, 4,570,872, Cl. 242-107.000.
Tsutsumi, Takashi; and Matsumoto, Shuji, 4,570,969, Cl. 280-664.000.
Wada, Yoshimi, 4,570,681, Cl. 139-1.00E.
Nissei Plastics Industrial Co., Ltd.: *See*—
Shima, Yoshiharu; Miyahara, Masaaki; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,571,169, Cl. 425-451.900.
Nisshin Steel Co., Ltd.: *See*—
Yamada, Toshiro; Sakai, Noriyasu; and Kawase, Hisao, 4,571,367, Cl. 428-653.000.
Nitta Beluto Kabushikikaisha: *See*—
Nakano, Takao; and Tochimori, Shigemitsu, 4,571,220, Cl. 474-100.000.
NL Industries, Inc.: *See*—
Birchak, James R.; and Lygas, Edward A., 4,571,693, Cl. 364-509.000.
Fontenot, John E.; and Murphy, Richard D., 4,570,480, Cl. 73-155.000.
Matthias, Terry R.; and Barr, John D., 4,570,725, Cl. 175-329.000.
Noda, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Static semiconductor memory device. 4,571,703, Cl. 365-154.000.
Noda, Tsutomu; Iso, Yoshimi; and Sato, Tetsuo, to Hitachi, Ltd. Digital/analogue converter. 4,571,572, Cl. 340-347.0DA.
Noe, Raymond J., to General Electric Company. Lamp glass envelope and method for manufacture a lamp glass envelope. 4,571,252, Cl. 65-82.000.

Noguchi, Masaru: *See*—
Ishikawa, Hiromi; and Noguchi, Masaru, 4,571,020, Cl. 350-3.710.
Noguchi, Takao: *See*—
Kamio, Hiroshi; Ueno, Yasushi; Noguchi, Takao; Kunioka, Kazuo; and Fukuda, Shuzo, 4,570,453, Cl. 62-375.000.
Noguchi, Yasuhiro; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Spectrally sensitized inner latent image type silver halide photographic emulsions. 4,571,380, Cl. 430-589.000.
Nolan, Daniel: *See*—
Atkins, Terrance J.; Field, Martin J.; and Nolan, Daniel, 4,570,600, Cl. 123-468.000.
Noland, Larry F.: *See*—
Noland, Wayne B.; and Noland, Larry F., 4,570,576, Cl. 119-73.000.
Noland, Wayne B.; and Noland, Larry F. Animal watering cup apparatus. 4,570,576, Cl. 119-73.000.
Nomura, Hiroaki; and Akimoto, Hiroshi, to Takeda Chemical Industries Ltd. Substituted 5-aminomethyl-2-acylaminopyrrolo[2,3-d]pyrimidin-4-ones. 4,571,423, Cl. 544-280.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Wenzel, Werner, 4,570,784, Cl. 198-399.000.
Norman, Peter: *See*—
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,571,405, Cl. 514-437.000.
Norris, John L.; and Schwartz, Lee K. Corneal light shield. 4,570,626, Cl. 128-132.00R.
North American Philips Consumer Electronics Corp.: *See*—
Gallaro, Anthony V.; and Josephs, Mark A., 4,571,521, Cl. 313-402.000.
North American Philips Corporation: *See*—
Akse, James R., 4,571,276, Cl. 156-89.000.
Northern Telecom Limited: *See*—
Rosenbaum, Stanley D.; and Plett, Calvin, 4,571,460, Cl. 179-16.0AA.
Suffi, Louis; and Burtelson, Frederick W., 4,571,013, Cl. 339-14.00R.
Znojkiewicz, Maciej E., 4,571,564, Cl. 333-230.000.
Nosse, John G.: *See*—
Carmichael, Richard W.; and Nosse, John G., 4,571,007, Cl. 303-7.000.
Novak, Mark T.: *See*—
Perkins, Warren E.; and Novak, Mark T., 4,570,819, Cl. 220-374.000.
Novikov, Sergei S., deceased: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Nowak, Franz; Gietl, Albert; Leo, Rolf; and Singer, Gerhard, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Wheel, especially disk wheel. 4,571,005, Cl. 301-63.0PW.
Nozaki, Masayuki: *See*—
Mitsumatsu, Yoshio; Kamio, Akio; Seike, Shoji; and Nozaki, Masayuki, 4,571,660, Cl. 361-127.000.
Numata, Yoshimi: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.
Oak Industries Inc.: *See*—
Davidov, Mircho A.; and Tentler, Michael L., 4,571,622, Cl. 358-194.100.
Oaks, Del. Controllable golf bag cart. 4,570,731, Cl. 180-19.300.
Oberleitner, Wolfgang: *See*—
Zagler, Wolfgang; and Oberleitner, Wolfgang, 4,571,190, Cl. 434-114.000.
Oberschelp, Heinz-Rolf: *See*—
Reinke, Kurt; Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, 4,570,555, Cl. 112-67.000.
Ochiai, Yoshinori: *See*—
Taniguchi, Masakazu; Baba, Masatoshi; Ochiai, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, 4,571,397, Cl. 514-252.000.
O'Connell, James P.; and Sage, Burton H., Jr., to Becton Dickinson and Company. Detection of reticulocytes. 4,571,388, Cl. 436-63.000.
Odaka, Kuniyuki: *See*—
Kawaguchi, Shojiro; and Odaka, Kuniyuki, 4,570,272, Cl. 4-302.000.
O'Donovan, Wendy O.: *See*—
Oglevee, James R.; Tammen, James F.; and O'Donovan, Wendy O., 4,570,379, Cl. 47-58.000.
Oechsle, Sixtus J., III. Polyurethane compositions and their use as luting agents. 4,570,270, Cl. 2-18.000.
Offermann, Paul F., to Chevron Research Company. Methods and apparatus for supplying electrical power for proximity effect heat-tracing. 4,571,487, Cl. 219-482.000.
Ogata, Kojiro: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Ogden, Charles A., to Smith International, Inc. I. D. Helix grooving head. 4,571,128, Cl. 408-1.00R.
Oglevee Associates, Inc.: *See*—
Oglevee, James R.; Tammen, James F.; and O'Donovan, Wendy O., 4,570,379, Cl. 47-58.000.
Oglevee, James R.; Tammen, James F.; and O'Donovan, Wendy O., to Oglevee Associates, Inc. Lily processes. 4,570,379, Cl. 47-58.000.
O'Grady, William E.: *See*—
Skotheim, Terje A.; O'Grady, William E.; and Linkous, Clovis A., 4,571,029, Cl. 350-357.000.
Ogrinc, Joseph F.: *See*—
Holmstrom, Paul E.; and Ogrinc, Joseph F., 4,570,313, Cl. 29-26.00A.
Ohara, Toshio; Fukumi, Sigenobu; and Yamauchi, Yoshiyuki, to Nippondenso Co., Ltd. Flat, multi-luminal tube for cross-flow-type indirect heat exchanger, having greater outer wall thickness towards side externally subject to corrosive inlet gas such as wet, salty air. 4,570,700, Cl. 165-134.100.
O'Hern, Michael J. Workbench construction. 4,570,915, Cl. 269-295.000.
Ohira, Hitoshi: *See*—
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, 4,571,285, Cl. 204-1.00T.
Ohkata, Ichizo, to Kato Hatsujo Kaisha, Ltd. Drain valve. 4,570,852, Cl. 236-93.00R.
Ohkawa, Nobuhisa: *See*—
Kobayashi, Nobuyuki; Isobe, Toshiaki; Ohkawa, Nobuhisa; and Kuma, Takahide, 4,571,683, Cl. 364-431.050.
Ohkoshi, Tokio: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Ohkoshi, Tokio, 4,571,610, Cl. 357-67.000.
Ohsaki, Hiromi: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.
Ohta, Kazutoshi; and Suzuki, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Elevator hoisting device. 4,570,753, Cl. 187-1.00R.
Ohta, Masao: *See*—
Kato, Yasuyoshi; Konishi, Kunihiko; and Ohta, Masao, 4,571,329, Cl. 423-239.000.
Ohta, Norio: *See*—
Unno, Kunihiko; Tsujiuchi, Toshio; and Ohta, Norio, 4,570,387, Cl. 51-165.710.
Oikawa, Masayuki: *See*—
Hirayama, Tetsuro; Oikawa, Masayuki; and Horie, Ichirou, 4,570,558, Cl. 112-162.000.
Oishi, Kengo; and Moriwaki, Masayoshi, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,570,877, Cl. 242-199.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette having improved magnetic shielding. 4,571,654, Cl. 360-130.210.
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Continuous process for producing reinforced resin laminates. 4,571,279, Cl. 156-270.000.
Ojima, Masahiro; Niihara, Toshio; and Fujiwara, Hideo, to Hitachi, Ltd. Magneto-optic information storage system utilizing a self-coupled laser. 4,571,650, Cl. 360-114.000.
Ojiro, Yoshitaka: *See*—
Akanuma, Shigetake; Takashima, Satoshi; Imamura, Haruo; and Ojiro, Yoshitaka, 4,571,002, Cl. 299-22.000.
Okada, Akira: *See*—
Sato, Nobuhiro; Okada, Akira; and Nakashima, Yutaka, 4,571,362, Cl. 428-329.000.
Okada, Yozo: *See*—
Watanabe, Kozo; Kawada, Masashi; and Okada, Yozo, 4,570,422, Cl. 53-557.000.
Okamoto, Akira: *See*—
Mizoguchi, Hakaru; Egawa, Akira; and Okamoto, Akira, 4,571,730, Cl. 372-58.000.
Okamoto, Harunori: *See*—
Kazusa, Susumu; Okamoto, Harunori; and Fukuchi, Eiji, 4,570,689, Cl. 152-209.00R.
Okamoto, Tetsuhiko: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; and Fuzikawa, Kazuhiko, 4,571,310, Cl. 260-973.000.
Okayama, Tsutomu, to Hitachi, Ltd. Differential pressure measuring transducer assembly. 4,570,498, Cl. 73-720.000.
Oki Electric Industry, Ltd.: *See*—
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
Okita, Tsutomu: *See*—
Kawaguchi, Hideo; Okita, Tsutomu; and Tamaki, Hiroyuki, 4,571,361, Cl. 428-328.000.
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, to Morinaga Milk Industry Co., Ltd. Method for preparing milk shake beverage. 4,571,338, Cl. 426-324.000.
Okubo, Keigo; Toba, Shoji; and Kumagai, Tokuo, to Nagano Prefecture; and Kabushiki Kaisha Chiyoda. Electrolytically producing anodic oxidation coat on Al or Al alloy. 4,571,287, Cl. 204-37.600.
Olds, Keith A.: *See*—
Nelson, Robert N.; Olds, Keith A.; and White, Scott C., 4,571,514, Cl. 307-234.000.
Olenfalk, Lars; and Delbou, Tor, to Arla. Pipe connection with a seal ring satisfying hygienic demands. 4,570,983, Cl. 285-355.000.
Olesen, Paul, to Swingline, Inc. Staple forming and driving machine. 4,570,841, Cl. 227-95.000.
Olin Corporation: *See*—
Bridges, William G., 4,570,567, Cl. 118-64.000.

Butt, Sheldon H., 4,570,337, Cl. 29-840.000.
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,570,699, Cl. 164-503.000.
Yarwood, John C.; and Tyler, Derek E., 4,570,696, Cl. 164-467.000.

Oliver, Allen W.: *See—*
Bingham, John; and Oliver, Allen W., 4,571,722, Cl. 370-106.000.

Olsson, Nils A.; and Patel, Chandra K. N., to AT&T Bell Laboratories. High speed analog-to-digital converter. 4,571,576, Cl. 340-347.0AD.

Olszewski, William V.: *See—*
LeGrand, Donald G.; and Olszewski, William V., 4,571,280, Cl. 156-329.000.

Oltman, John P.; Kreger, Steven J.; and Purchase, Richard D., to Waterloo Industries, Inc. Storehouse construction. 4,570,392, Cl. 52-64.000.

Oltmans, Ziegel und Kunststoffe GmbH: *See—*
Othold, Rolf; and Hetzenecker, Heinz, 4,570,976, Cl. 285-4.000.

Olympus Optical Co., Ltd.: *See—*
Nakamura, Toru, 4,571,034, Cl. 350-432.000.
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.
Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, 4,571,049, Cl. 354-410.000.
Yoshikawa, Shoji, 4,571,728, Cl. 372-36.000.

Omron Tateisi Electronics, Co.: *See—*
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Onaka, Tatsumi: *See—*
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.

Oneal, Dean: *See—*
Turner, Dewayne; Menard, Raymond A.; and Oneal, Dean, 4,570,714, Cl. 166-278.000.

O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., to McDonald Products Corporation. Desk console element. 4,570,793, Cl. 206-371.000.

Ono, Kimizo, to Sumitomo Electric Industries, Ltd. Device for observing pictures. 4,571,023, Cl. 350-96.250.

Ono, Kozo: *See—*
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.

Ono, Toshiaki; and Kusabuka, Yoshito, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ribbon mask device. 4,571,102, Cl. 400-248.000.

Onoda, Hiroshi: *See—*
Hashizume, Takeshi; and Onoda, Hiroshi, 4,571,434, Cl. 564-103.000.

Onodera, Masahiro, to Alps Electric Co., Ltd. Variable resistor acuated by pivotal actuator. 4,571,571, Cl. 338-162.000.

Orain, Michel A., to Glaenzer Spicer. Transmission joint, in particular for a motor vehicle. 4,571,214, Cl. 464-111.000.

Orain, Michel A.: *See—*
Balken, Jochen; Krude, Werner; and Orain, Michel A., 4,571,099, Cl. 384-513.000.

O'Reilly, Kevin J.: *See—*
Fishman, Bernard; Hitchcock, Louise M.; and O'Reilly, Kevin J., 4,571,386, Cl. 435-235.000.

Orndorff, Karl B.; and Sherwood, Edward F., to Westinghouse Electric Corp. Elevator cab with retractable buttons for protective pads. 4,570,754, Cl. 187-1.00R.

Ortyl, George M., to Maremont Corporation. Mechanical lock joint for joining tubular products. 4,570,747, Cl. 181-243.000.

Osanai, Hiroshi: *See—*
Nakazawa, Mitsuhiro; Osanai, Hiroshi; Isono, Yoshiya; Asada, Akiyoshi; and Ohira, Hitoshi, 4,571,285, Cl. 204-1.00T.

Osanai, Takenori; and Oushiden, Hideshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,571,061, Cl. 355-8.000.

Osborn, Harley G., to Gary W. Clem, Inc. Free floating foldable tool bar. 4,570,722, Cl. 172-311.000.

Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, to Mitsui Engineering and Shipbuilding Company, Limited. Floating offshore structure. 4,571,125, Cl. 405-224.000.

Osterday, John R., to General Motors Corporation. Variable reach windshield wiper system. 4,570,283, Cl. 15-250.210.

Othold, Rolf; and Hetzenecker, Heinz, to Oltmans, Ziegel und Kunststoffe GmbH. Sleeve-shaped coupling for pipelines. 4,570,976, Cl. 285-4.000.

Otis Engineering Corporation: *See—*
Setterberg, John R., Jr., 4,570,707, Cl. 166-214.000.

Otobe, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Method of feedback-controlling idling speed of internal combustion engine. 4,570,592, Cl. 123-339.000.

Otomo, Shigekazu: *See—*
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Adachi, Masakazu, 4,571,382, Cl. 435-7.000.

Otto, Gunter, to Edouard Dubied & Cie. S.A. Needle selection device for a knitting machine. 4,570,463, Cl. 66-221.000.

Oushiden, Hideshi: *See—*
Osanai, Takenori; and Oushiden, Hideshi, 4,571,061, Cl. 355-8.000.

Outokumpu Oy: *See—*
Sipila, Heikki J.; and Jarvinen, Marja-Leena, 4,571,196, Cl. 445-53.000.

Owens-Corning Fiberglas Corporation: *See—*
Higginbotham, James M., Jr.; Varasso, Eugene C.; Rapp, Kenneth L.; and Sunkle, Thomas H., 4,571,587, Cl. 340-825.530.
Klett, Paul A.; Bakhshi, Shiv K.; and Granger, Mark A., 4,570,859, Cl. 239-455.000.
Patil, Bhalchandra B.; and White, J. Matthew, 4,571,116, Cl. 404-76.000.
Sullivan, Timothy A.; and Morgan, Gregory L., 4,571,251, Cl. 65-12.000.

Owens-Illinois, Inc.: *See—*
Chang, Long F.; and Steele, Scott W., 4,571,173, Cl. 432-9.000.
Thomas, Ian M.; and Tillman, James J., 4,571,366, Cl. 428-446.000.

Oya, Anders, to Stiansen & Oya A/S. Front-mounted, shock-absorbing attachment means for a snowplow on a vehicle. 4,570,367, Cl. 37-232.000.

P.M. Sports Development Limited: *See—*
Lukas, Peter, 4,570,372, Cl. 43-1.000.

Pace, Inc.: *See—*
Vogel, Alan D., 4,571,482, Cl. 219-237.000.

Pacific Fence & Wire Co.: *See—*
Walden, Fred O., 4,570,906, Cl. 256-34.000.

Paine, Christopher G.; White, William J.; and Resnick, Susan J., to Honeywell Inc. Apparatus and method for fabricating backside mosaic of photoconductive infrared detectors. 4,570,329, Cl. 29-572.000.

Palacio, Joaquin J.; and Cristobal, Carlos C., to Gang-Nail Systems, Inc. Truss assembly and attachment member for use with trusses. 4,570,407, Cl. 52-693.000.

Palacio, Joaquin J.: *See—*
Rionda, Carlos S.; and Palacio, Joaquin J., 4,571,114, Cl. 403-400.000.

Palm Harbor Homes, Inc.: *See—*
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Palotas, Laszlo : *See—*
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, 4,570,964, Cl. 280-403.000.

Pangos, William, to General Motors Corporation. Pressure control valving for pneumatic leveling systems. 4,570,972, Cl. 280-714.000.

Paper Machinery Corporation: *See—*
Konzal, Daryl R., 4,571,233, Cl. 493-109.000.

Papuchon, Michel; Arditty, Herve ; Graindorge, Philippe; and Huignard, Jean-Pierre, to Thomson-CSF. Michelson interferometer with a photorefractive mirror. 4,571,080, Cl. 356-345.000.

Para Joan, Josep: *See—*
Ferret Bofill, Joaquim; and Para Joan, Josep, 4,570,759, Cl. 188-73.320.

Paratech Incorporated: *See—*
Roxton, George F.; and Leibovitz, Howard, 4,570,677, Cl. 137-881.000.

Pardo, Richard J.: *See—*
Pardo, Warren A.; Pardo, Richard J.; and Gabriele, Valentino, 4,571,091, Cl. 366-311.000.

Pardo, Warren A.; Pardo, Richard J.; and Gabriele, Valentino, to J. C. Pardo and Sons. Food process agitator. 4,571,091, Cl. 366-311.000.

Park, Kwang H.: *See—*
Veling, Thomas R.; Wiklund, George C.; and Park, Kwang H., 4,570,317, Cl. 29-157.30A.

Parker, Edwin H.; and Piazza, Giacomo J., to Corning Glass Works. Method for depositing thin, transparent metal oxide films. 4,571,350, Cl. 427-109.000.

Parker-Hannifin Corporation: *See—*
Burke, Thomas A.; and Scheuerman, Curtis H., 4,570,668, Cl. 137-512.200.

Parma Corporation: *See—*
Rogers, Walter C., Jr., 4,570,995, Cl. 297-68.000.
Rogers, Walter C., Jr., 4,570,996, Cl. 297-85.000.

Particle Measuring Systems, Inc.: *See—*
Knollenberg, Robert G., 4,571,079, Cl. 356-336.000.

Patel, Chandra K. N.: *See—*
Olsson, Nils A.; and Patel, Chandra K. N., 4,571,576, Cl. 340-347.0AD.

Pater, Michel. Cigarette extinguisher for automobile. 4,570,647, Cl. 131-237.000.

Patil, Bhalchandra B.; and White, J. Matthew, to Owens-Corning Fiberglas Corporation. Method for suppressing dust on dirt roads and the like. 4,571,116, Cl. 404-76.000.

Patrick, Michael W.: *See—*
Stambaugh, Mark A.; Sacarisen, Stephen P.; and Patrick, Michael W., 4,571,675, Cl. 364-200.000.

Patt, Leonard M.: *See—*
Houck, John C.; and Patt, Leonard M., 4,571,336, Cl. 424-95.000.

Patton, Ira M.: *See—*
Knox, Floris B., 4,571,162, Cl. 417-554.000.

Patz, Benjamin W.: *See—*
Breglia, Denis R.; and Patz, Benjamin W., 4,571,631, Cl. 358-231.000.

Paul, Duane B., to General Electric Company. Liquid injection control in multi-stage compressor. 4,571,151, Cl. 415-1.000.

Paul Wurth S.A.: *See—*
Lonardi, Emile; and Kremer, Victor, 4,570,900, Cl. 251-58.000.
Rachner, Hans-Gunther; and Boiting, Hans-Herrmann, 4,570,552, Cl. 110-347.000.

Pauliukonis, Richard S. Simplified springless check valve. 4,570,669, Cl. 137-528.000.

Paulsen, David C.; Edens, Glenn T.; Nakamura, Karl S.; Gallatin, David M.; Hobson, Stephen R.; and Moggridge, William G., to Grid Systems Corporation. Portable computer. 4,571,456, Cl. 179-2.00C.

Pawelko, Karl-Heinz: *See—*
Rudszinat, Willy; and Pawelko, Karl-Heinz, 4,571,231, Cl. 493-11.000.

Pazzaglia, Luigi, to Cefin S.p.A. Device for positioning metal ends to be lap welded one to the other. 4,571,476, Cl. 219-61.300.

Peck, Anthony W., to Burroughs Wellcome Co. Lorazepam and bupropion, compositions and methods. 4,571,395, Cl. 514-221.000.

Peck, Paul L., to Tru Fire Corporation. Shock reduced bow. 4,570,606, Cl. 124-24.00R.

Peek, Brian R., to Illinois Tool Works Inc. Plastic push-on fastener. 4,571,136, Cl. 411-437.000.

Peetz, William F. Outboard motor cart. 4,570,960, Cl. 280-47.13R.

Penato, Jean-Marie, to Thomson-CSF. Process for selectively depositing a refractory metal layer on a graphite piece. 4,571,286, Cl. 204-15.000.

Pentel Kabushiki Kaisha: *See—*
Sekiguchi, Tomozo, 4,571,105, Cl. 401-65.000.

Penterman, Francis M., to D. C. Research, Inc. Air foil with trailing spoiler. 4,571,156, Cl. 416-132.00B.

Pergler, Charles C.: *See—*
Whitwam, Ronald L.; and Pergler, Charles C., 4,570,895, Cl. 248-575.000.

Perkin-Elmer Corporation, The: *See—*
Kendall-Tobias, Michael W., 4,571,172, Cl. 431-62.000.

Perkins, Warren E.; and Novak, Mark T., to Cryo, Corporation. Fill means for cryogenic flasks. 4,570,819, Cl. 220-374.000.

Perlini, Roberto. Motor vehicle suspension. 4,570,971, Cl. 280-680.000.

Perrone, Mathew R. P., Jr.: *See—*
Kiss, James M.; and Perrone, Mathew R. P., Jr., 4,571,194, Cl. 441-1.000.

Perry, Forbes G. B., to National Research Development Corporation. Transmission units of toroidal race rolling friction type. 4,570,501, Cl. 74-200.000.

Peschka, Walter; Schneider, Gottfried; and Nieratschker, Willi, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Method and device for operating a hydrogen motor. 4,570,578, Cl. 123-1.00A.

Peter, Fritz: *See—*
Distler, Walter; and Peter, Fritz, 4,571,495, Cl. 250-394.000.

Peterson, David A., to Cincinnati Milacron Inc. Rack lubricator. 4,570,505, Cl. 74-467.000.

Peterson, Earl H. Portable balcony accessory. 4,570,803, Cl. 211-88.000.

Petersson, Stig A.: *See—*
Johansson, Leif; Petersson, Stig A.; and Rudling, Bengt O., 4,571,260, Cl. 75-21.000.

Petkus, Paul A.: *See—*
Frain, Laura M.; and Petkus, Paul A., 4,571,268, Cl. 106-1.170.

Petrofsky, Jerrold S.; Phillips, Chandler A.; and Heaton, Harry H., III, to Wright State University. Therapeutic device. 4,570,927, Cl. 272-73.000.

Petrolite Corporation: *See—*
Matlach, William J.; Newberry, Michael E.; and Thierheimer, Charles L., Jr., 4,570,656, Cl. 137-13.000.

Peyton, Richard H.: *See—*
Thornton, Donald I.; and Peyton, Richard H., 4,570,604, Cl. 123-514.000.

Pfaff Industriemaschinen GmbH: *See—*
Hubele, Heinz, 4,570,560, Cl. 112-273.000.

Pfeuffer, Margaret S.: *See—*
Emry, Carl A., Jr.; Neuman, Grover H.; Mersiovsky, Lynda K.; and Pfeuffer, Margaret S., 4,571,700, Cl. 364-900.000.

Pfizer Hospital Products Group Inc.: *See—*
Ellison, Arthur E.; and Borzone, Rocco R., 4,570,623, Cl. 128-92.00B.

Philip Morris Incorporated: *See—*
Nichols, Walter A.; and Newsome, Reginald W., 4,570,649, Cl. 131-336.000.
Turnage, William E., 4,570,790, Cl. 206-263.000.

Phillips, Chandler A.: *See—*
Petrofsky, Jerrold S.; Phillips, Chandler A.; and Heaton, Harry H., III, 4,570,927, Cl. 272-73.000.

Phillips, James P.; and Kazecki, Henry L., to Motorola, Inc. Dual band transceiver antenna. 4,571,595, Cl. 343-745.000.

Phillips Petroleum Company: *See—*
Byers, Jim D.; and Banasiak, Dennis S., 4,571,438, Cl. 568-420.000.
Drake, Charles A., 4,571,431, Cl. 560-243.000.
Finch, Jack N.; and Sprague, Janice S., 4,571,269, Cl. 106-273.00R.

Phillips Plastics Corporation: *See—*
Beglinger, Gregory O.; Massof, Edward P.; and Schwind, Richard J., 4,571,134, Cl. 411-41.000.

Piazza, Giacomo J.: *See—*
Parker, Edwin H.; and Piazza, Giacomo J., 4,571,350, Cl. 427-109.000.

Picciola, Giampaolo; Gentili, Piergiorgio; Ravenna, Franco; and Riva, Mario, to Maggioni Farmaceutici S.p.A. 3-Pyridine acetic and 3-(3-pyridyl-methoxycarbonyl)-propionic acid pantetheine and pantetheine esters having hypolipemic activities. 4,571,401, Cl. 514-332.000.

Piedrafita, Roberto. Apparatus for improving gasoline consumption, power and reducing emission pollutants of internal combustion engines. 4,570,603, Cl. 123-570.000.

Pigeroulet, Jean: *See—*
Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, 4,571,161, Cl. 417-499.000.

Pigisch, Franz: *See—*
Klaucke, Thomas; and Pigisch, Franz, 4,570,849, Cl. 236-35.000.

Pike, Roscoe A.: *See—*
Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,571,317, Cl. 264-29.100.

Pintchovski, Fabio: *See—*
Price, J. B.; Tobin, Philip J.; Pintchovski, Fabio; and Seelbach, Christian A., 4,570,328, Cl. 29-571.000.

Pipko, Donald J. Precision attachment for denture construction. 4,571,186, Cl. 433-181.000.

Pirani, Giancarlo; and Zingarelli, Valerio, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Adaptive equalizer for binary signals and method of operating same. 4,571,732, Cl. 375-12.000.

Pisaric, Karl H.: *See—*
Thoma, Wilhelm; Pisaric, Karl H.; and Alberts, Heinrich, 4,571,417, Cl. 525-63.000.

Pitcher, Gerald K.: *See—*
Kunz, Raymond W.; and Pitcher, Gerald K., 4,570,616, Cl. 128-36.000.

Pitney Bowes Inc.: *See—*
Hooper, Clinton E.; and Silverman, Harold, 4,570,923, Cl. 271-275.000.
Marzullo, Joseph H., 4,570,757, Cl. 188-67.000.

Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Flavoring with ortho-dioxybenzaldehyde dimethyl mercaptals. 4,571,343, Cl. 426-535.000.

Pittet, Alan O.; Muralidhara, Ranya; Miller, Kevin P.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Flavoring with dithioethers of 2-phenyl-2-alkenals. 4,571,344, Cl. 426-535.000.

Pittsburgh Corning Corporation: *See—*
Kijowski, John; and Miller, Gregory D., 4,571,321, Cl. 264-43.000.

Placon Corporation: *See—*
Borst, Rodney D.; and Mohs, Thomas J., 4,570,818, Cl. 220-339.000.

Plastics, Inc.: *See—*
Pomroy, James F., 4,571,474, Cl. 219-10.55F.

Plavskikh, Vladimir D.: *See—*
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.

Plessey Overseas Limited: *See—*
Chadwick, Victor J., 4,571,711, Cl. 367-88.000.

Plett, Calvin: *See—*
Rosenbaum, Stanley D.; and Plett, Calvin, 4,571,460, Cl. 179-16.0AA.

Pohle, Werner P.: *See—*
Aprea, George F.; and Pohle, Werner P., 4,570,860, Cl. 239-478.000.

Polaroid Corporation: *See—*
Stempeck, John W., 4,571,627, Cl. 358-224.000.

Poler, Stanley. Eye-medicating contact-lens construction. 4,571,039, Cl. 351-160.00H.

Poler, Stanley, to Lynell Medical Technology, Inc. Contact lens and haptic. 4,571,040, Cl. 351-160.00R.

Pollack, Zoltan; and Svard, Bengt, to AB Akerlund & Rausing. Device for induction welding. 4,571,472, Cl. 219-9.500.

Pollak, Gerd: *See—*
Weber, Rolf; Pollak, Gerd; and Chlechowitz, Arno, 4,570,813, Cl. 220-3.000.

Polygress Plastic GmbH: *See—*
Fritz, Ulrich; and Kelz, Rony, 4,570,789, Cl. 206-83.500.

Pomroy, James F., to Plastics, Inc. Microwave oven rotisserie and stirrer. 4,571,474, Cl. 219-10.55F.

Ponto, Robert: *See—*
Martin, Hardison G.; and Ponto, Robert, 4,571,554, Cl. 330-252.000.

Postler, Gunther: *See—*
Bock, Erich; Hammer, Helmut; and Postler, Gunther, 4,570,541, Cl. 102-216.000.

Potter, Raymond G., to Du Pont de Nemours, E. I., and Company. Centrifuge rotor having a retaining arrangement thereon. 4,571,238, Cl. 494-12.000.

Powell Duffryn Engineering Limited: *See—*
Chaplin, Neale A., 4,570,661, Cl. 137-115.000.

Powling, Christopher F.: *See—*
Conquest, Alexander R.; and Powling, Christopher F., 4,571,662, Cl. 361-306.000.

PPG Industries, Inc.: *See—*
Nielsen, Donald R., 4,571,255, Cl. 71-88.000.

Pracht, Gunther, to August Reutershan GmbH. & Co. KG. Cork screw having a bell-shaped housing. 4,570,512, Cl. 81-3.290.

Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi, 4,570,460, Cl. 66-135.000.
Sawazaki, Masatoshi, 4,570,461, Cl. 66-194.000.

Preiner, Gerhard: *See—*
Hockemeyer, Friedrich; John, Peter; Muller, Johann; and Preiner, Gerhard, 4,571,349, Cl. 427-54.100.

Premi, Mauro; and Guzzoni, Gianfranco, to Mesdan S.p.A. Apparatus for splicing textile threads. 4,570,427, Cl. 57-22.000.

Price, J. B.; Tobin, Philip J.; Pintchovski, Fabio; and Seelbach, Christian A., to Motorola, Inc. Method of producing titanium nitride MOS device gate electrode. 4,570,328, Cl. 29-571.000.

Primavera, Russell R. Tamper-proof baiting device for rodents and the like. 4,570,377, Cl. 43-131.000.
Prince Corporation: *See*—
Flowerday, Carl, 4,570,990, Cl. 296-97.00H.
Prins, Johan F. Photovoltaic cell of semi-conducting diamond. 4,571,447, Cl. 136-252.000.
Procacino, Robert A., to Cozzoli Machine Co. Computer operated filling system. 4,570,822, Cl. 222-14.000.
Procter & Gamble Company, The: *See*—
Riley, Dennis P.; Anderson, Mark M.; and Rotruck, John T., 4,571,391, Cl. 514-4.000.
Product Design & Development, Inc.: *See*—
Sterner, Maurice E., Jr., 4,570,381, Cl. 49-129.000.
Production Equipment & Engineering Co.: *See*—
Rosser, Michael C., 4,570,913, Cl. 269-22.000.
Prufer, George O.: *See*—
Jones, James F.; and Prufer, George O., 4,571,119, Cl. 404-96.000.
Pruitt, Kenneth W. Bundle drum stick. 4,570,527, Cl. 84-422.00S.
Pugnet, Gerard, to Alsthom-Atlantique. Device for handling rods for oil-well drilling. 4,570,706, Cl. 166-77.500.
Pullman Standard, Inc.: *See*—
Ferris, Ray L.; and Yates, Donald B., 4,570,816, Cl. 220-314.000.
Miller, Roy W.; and Kunst, Robert J., 4,570,807, Cl. 213-60.000.
Purchase, Richard D.: *See*—
Oltman, John P.; Kreger, Steven J.; and Purchase, Richard D., 4,570,392, Cl. 52-64.000.
Purdue Research Foundation: *See*—
Elton, David J.; and Harr, Milton E., 4,571,695, Cl. 364-550.000.
Purzycki, Alfred Z.: *See*—
Jung, Werner; and Purzycki, Alfred Z., 4,571,104, Cl. 400-616.300.
Quadra Wheelchairs, Inc.: *See*—
Minnebraker, Jeffrey P.; and Linder, George E., 4,570,756, Cl. 188-2.00F.
Quante, M. John; and Cutler, Terry W., to Flanders Filters, Inc. Connector for a filter bank supporting framework and method of assembling same. 4,570,391, Cl. 52-39.000.
Qume Corporation: *See*—
Huang, Lawrence K., 4,570,919, Cl. 271-9.000.
R. A. Jones & Co. Inc.: *See*—
Adams, Charles W., 4,571,236, Cl. 493-319.000.
R. R. Donnelley & Sons Company: *See*—
Webb, Claymon D., 4,570,538, Cl. 101-148.000.
Rabatin, Jacob G., to General Electric Company. Process for the preparation of rare earth oxyhalide phosphor. 4,571,305, Cl. 252-301.40H.
Rabe, George B., to Foster Wheeler Energy Corporation. Internal bore welding torch having removable flexible wand for remote welding. 4,571,475, Cl. 219-60.00A.
Rachner, Hans-Gunther; and Boiting, Hans-Herrmann, to Paul Wurth S.A. Process and apparatus for delivering carbon material to a furnace. 4,570,552, Cl. 110-347.000.
Radel, Robert J.; and Sullivan, Jack M., to Tennessee Valley Authority. Preparation of nitrogen fertilizers from oxalate esters prepared by the oxidative carbonylation of alcohols over noble metal catalysts utilizing regenerable 2,5-cyclohexadiene-1,4-dione oxidants. 4,571,435, Cl. 564-135.000.
Radioelectriques et 501 Telecommunications: *See*—
Brie, Richard; and Guidoux, Loic B. Y., 4,571,465, Cl. 179-170.200.
Radman, Anton J.: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,571,646, Cl. 360-99.000.
Raichle Sportschuh AG: *See*—
Walkhoff, Klaus, 4,570,364, Cl. 36-121.000.
Ranney, David F., to Board of Regents, University of Texas System. Array sonicator apparatus for automated sample preparation. 4,571,087, Cl. 366-108.000.
Ranz, Erwin: *See*—
Sauerteig, Wolfgang; Ranz, Erwin; and Schutz, Heinz, 4,571,378, Cl. 430-505.000.
Rapp, Kenneth L.: *See*—
Higginbotham, James M., Jr.; Varasso, Eugene C.; Rapp, Kenneth L.; and Sunkle, Thomas H., 4,571,587, Cl. 340-825.530.
Raschack, Manfred: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.
Raterman, Donald E. Apparatus and method for terminating coin sorting. 4,570,655, Cl. 133-3.00A.
Ratti, Satya P., to Tabel- und Metallwerke Gutehoffnungshuette. Conduction of a chemically aggressive fluid. 4,570,680, Cl. 138-149.000.
Raubach, Manfred: *See*—
Ghibu, Michael; Hartel, Volker; Heynemann, Carl; and Raubach, Manfred, 4,570,748, Cl. 181-286.000.
Raudat, John L., to Standard-Knapp, Inc. Case packer with load decelerating and impact absorbing means. 4,570,413, Cl. 53-247.000.
Ravenna, Franco: *See*—
Picciola, Giampaolo; Gentili, Piergiorgio; Ravenna, Franco; and Riva, Mario, 4,571,401, Cl. 514-332.000.
Ray, Levon L.; and Longoria, Jose L., to Ciba-Geigy Corporation. Route to hybrid cotton production. 4,570,380, Cl. 47-58.000.
Raychem Corporation: *See*—
Leary, David F., 4,571,481, Cl. 219-205.000.
Raymond, Leonard S.; and Jewett, Warren R., to Southwest Medical Products, Inc. Specific material detection and measuring device. 4,571,543, Cl. 324-425.000.
Raytheon Company: *See*—
Brown, William C., 4,571,552, Cl. 330-47.000.
Raz, Omri, to Eshet Eilon. Method and apparatus for closing and stacking boxes. 4,570,420, Cl. 53-485.000.
RCA Corporation: *See*—
Anderson, William D., 4,571,620, Cl. 358-166.000.
Armstrong, Lee R., 4,570,530, Cl. 89-41.050.
Dischert, Robert A.; Meise, William H.; and Berard, Clement A., Jr., 4,571,511, Cl. 307-547.000.
Hasili, Jacob P., 4,571,617, Cl. 358-107.000.
Rebas, Erich, to Valmet-Dominion Inc. Reversible slice lip. 4,571,283, Cl. 162-344.000.
Reece, John M.: *See*—
Belmondo, Victor E.; dePina, Russell M.; James, George W.; Martin, Robert G.; and Reece, John M., 4,571,724, Cl. 371-25.000.
Rees, James D.: *See*—
Lama, William L.; and Rees, James D., 4,571,022, Cl. 350-96.250.
Reeves, Anthony V., to Du Pont de Nemours, E. I., and Company. Heat-fusion pipe fitting system. 4,571,488, Cl. 219-544.000.
Reeves, James B., Jr. Adjustable pitch sprocket. 4,571,218, Cl. 474-49.000.
Regina Corporation: *See*—
Groth, Hugh F.; and Collins, John M., 4,570,856, Cl. 239-310.000.
Rehage, Teddy A.: *See*—
Herzog, Alexander; Honomichl, Larry L.; Nagda, Jagdish M.; and Rehage, Teddy A., 4,571,699, Cl. 364-900.000.
Rehau AG and Co.: *See*—
Wunderlich, Ernst; and Robl, Gerd, 4,570,948, Cl. 277-226.000.
Reichel, Kenneth; Nichols, Frederick W., III; and Levenstein, Norm, to Kabushiki Kaisha Audio-Technica. Adapter for a plug-in cartridge. 4,571,717, Cl. 369-256.000.
Reichhold Chemicals, Incorporated: *See*—
White, James T., Sr.; and Kennedy, Dan J., 4,571,356, Cl. 428-143.000.
Reid, James; and Roberts, Gary E., to Applied Magnetics Corporation. Method of manufacturing a magnetic head assembly and product. 4,571,651, Cl. 360-113.000.
Reimann, Robert C.; and Root, Richard A., to United States of America, Energy. Direct fired heat exchanger. 4,570,456, Cl. 62-476.000.
Reinke, Kurt; Kastrup, Eberhard; and Oberschelp, Heinz-Rolf, to Durkoppwerke GmbH. Drive device for a two-threaded chain-stitch buttonhole sewing machine. 4,570,555, Cl. 112-67.000.
Reinker, Joseph F., Jr.: *See*—
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,570,981, Cl. 285-332.300.
Rel Corporation, The: *See*—
Fattori, Lazzaro A., 4,570,826, Cl. 222-83.000.
Renard, Pierre: *See*—
Bischoff, Didier; Courteheuse, Gerard; and Renard, Pierre, 4,571,326, Cl. 422-207.000.
Renaud, Pierre: *See*—
Caray, Andre ; and Renaud, Pierre, 4,570,775, Cl. 192-106.200.
Renlund, Gary M.; and Johnson, Curtis A., to General Electric Company. Thermoplastic molding of ceramic powder. 4,571,414, Cl. 524-322.000.
Resnick, Joseph A. Interoral Electrolarynx. 4,571,739, Cl. 381-70.000.
Resnick, Susan J.: *See*—
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,570,329, Cl. 29-572.000.
Retzloff, James G.; and Sanders, Gerald W., to Viking Corporation, The. Sprinkler head. 4,570,720, Cl. 169-39.000.
Revane, James E.: *See*—
Kane, Lawrence M.; and Revane, James E., 4,570,642, Cl. 128-785.000.
Revells, Robert G.; and Enk, Allan T., to Libbey-Owens-Ford Company. Press bending apparatus. 4,571,253, Cl. 65-273.000.
Rexroth Sigma: *See*—
Constantinian, Krikor, 4,570,671, Cl. 137-596.000.
Rezanka, Ivan, to Xerox Corporation. Ink cartridge for an ink jet printer. 4,571,599, Cl. 346-140.00R.
Reznikov, Igor I.: *See*—
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.
Rhodes, Edward: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,571,094, Cl. 374-29.000.
Rhodes, Tony: *See*—
Barbato, Michael W.; Rhodes, Tony; and Watts, Edward W., 4,571,198, Cl. 446-73.000.
Rice, G. Kenneth, to Teknico Industries, Inc. Aqueous silicon compounds in oil well recovery methods. 4,570,713, Cl. 166-275.000.
Rice, G. Kenneth, to Teknico Industries, Inc. Aqueous hydrides. 4,571,328, Cl. 423-69.000.
Richard, Raymond L., Jr.: *See*—
Molloy, Edward W.; and Richard, Raymond L., Jr., 4,571,226, Cl. 474-190.000.
Richmond, John F.; Mauer, Dieter; and Baum, Heinz O., to USM Corporation. Retaining clip. 4,570,303, Cl. 24-16.0PB.
Richter, John M.; and Bair, James G., Jr., to Fox Grinders, Inc. Computer controlled workpiece finishing apparatus. 4,570,385, Cl. 51-165.710.
Richter, Karl: *See*—
Gerontopoulos, Panaiotis; Cogliati, Guido; and Richter, Karl, 4,571,315, Cl. 264-0.500.

Richter, Martin; and Schweiger, Josef, to Siemens Aktiengesellschaft. Device for mounting electronic components to circuit board. 4,570,336, Cl. 29-838.000.

Richter, Robert A. Mechanism for controlling the operation of machines. 4,570,500, Cl. 74-54.000.

Ricoh Company, Ltd.: *See*—
Koizumi, Yutaka; and Akutsu, Eiichi, 4,571,057, Cl. 355-3.00R.
Kondo, Mitsuru, 4,571,633, Cl. 358-280.000.
Morrison, Elden R., 4,571,066, Cl. 355-15.000.
Sakuma, Nobuo, 4,571,035, Cl. 350-433.000.
Tani, Tatsuo; and Kawaishi, Yasunori, 4,571,056, Cl. 355-3.0FU.
Tomita, Satoru, 4,571,070, Cl. 355-15.000.

Ricoh Company, Ltd: *See*—
Motosugi, Takanori; and Sakai, Hisashi, 4,571,605, Cl. 346-216.000.

Rieter Machine Works Limited: *See*—
Wetter, Kurt, 4,570,743, Cl. 181-200.000.

Rifu, Toshihiro: *See*—
Nishiki, Masayuki; and Rifu, Toshihiro, 4,571,494, Cl. 250-370.000.

Riggs, David L.: *See*—
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Right, Robert W., to General Signal Corporation. Alarm console controls. 4,571,586, Cl. 340-825.510.

Riley, Dennis P.; Anderson, Mark M.; and Rotruck, John T., to Procter & Gamble Company, The. Chromium acetylacetonate as a dietary supplement and pharmaceutical agent. 4,571,391, Cl. 514-4.000.

Ringsmuth, Richard J.; and Kaufman, Jay S., to United States of America, Energy. Tube support grid and spacer therefor. 4,570,703, Cl. 165-162.000.

Rionda, Carlos S.; and Palacio, Joaquin J., to Gang-Nail Systems, Inc. Strap connector. 4,571,114, Cl. 403-400.000.

Ripka, Chester D.; Friedman, James N.; and Drago, Thomas E., to Carrier Corporation. Induced draft submerged burner. 4,570,612, Cl. 126-360.00A.

Rite-Hite Corporation: *See*—
Hahn, Norbert; and Swessel, Michael A., 4,570,277, Cl. 14-71.300.

Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Berg, Franco, 4,570,889, Cl. 248-220.200.

RIV-SKF Officine di Villar Perosa S.p.A.: *See*—
Colanzi, Franco; and Beton, Gordon, 4,571,227, Cl. 474-199.000.

Riva, Mario: *See*—
Picciola, Giampaolo; Gentili, Piergiorgio; Ravenna, Franco; and Riva, Mario, 4,571,401, Cl. 514-332.000.

Roan Industries, Inc.: *See*—
Bogle, Hugh A.; and Buchanan, Charles E., 4,571,175, Cl. 432-14.000.

Robbins, Clyde; and Morenilla, Luis, to General Instrument Corporation. Timing generator for sync suppressed television signals. 4,571,615, Cl. 358-120.000.

Robbins, Jack L.: *See*—
Kane, Noel S.; Robbins, Jack L.; and Coops, Melvin S., 4,571,492, Cl. 250-303.000.

Robert Bosch GmbH: *See*—
Bitzer, Rainer, 4,571,696, Cl. 364-552.000.
Frister, Manfred, 4,571,612, Cl. 357-81.000.
Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, 4,571,161, Cl. 417-499.000.

Roberts, Gary E.: *See*—
Reid, James; and Roberts, Gary E., 4,571,651, Cl. 360-113.000.

Roberts, Wf. Dual purpose closure for heat exchangers. 4,570,701, Cl. 165-158.000.

Robin, Max S.; Tamburro, Peter J.; and Weiss, Roger E., to AT&T Bell Laboratories. High frequency modular connector. 4,571,014, Cl. 339-14.00R.

Robinson, Kelly S.; Weitzel, Richard A.; and Kroll, Arthur S., to Eastman Kodak Company. Electrographic development apparatus. 4,570,572, Cl. 118-657.000.

Robison, Hollis G., to Gray Tool Company. Stepwise rotary actuator. 4,570,724, Cl. 175-113.000.

Robl, Gerd: *See*—
Wunderlich, Ernst; and Robl, Gerd, 4,570,948, Cl. 277-226.000.

Robson, John H.: *See*—
Keen, Brian T.; and Robson, John H., 4,571,440, Cl. 568-872.000.

Rockwell International Corporation: *See*—
Chow, Pei-Ming D., 4,571,538, Cl. 324-65.00R.
Head, Manley J., 4,571,550, Cl. 329-50.000.
Wooten, John R.; Walter, Robert J.; and Shaw, Thomas M., 4,571,086, Cl. 366-127.000.

Rodam SA: *See*—
Dahan, Jose , 4,571,177, Cl. 433-7.000.

Rodgers, Frederick J.: *See*—
McPeak, Ercel W.; Felzer, Theodore; and Rodgers, Frederick J., 4,570,953, Cl. 280-5.300.

Rodrigues, Anil N.: *See*—
Cable, Harold E.; and Rodrigues, Anil N., 4,570,542, Cl. 104-119.000.

Rodriguez-Pena, Alonso; Cheng, Tsen-Chung; and Wu, Chuck Y., to USC. High voltage field mapping apparatus and method. 4,571,539, Cl. 324-72.000.

Roe, Geoffrey E., to Victoria University of Manchester, The. Internal combustion engine. 4,570,586, Cl. 123-192.00B.

Rogers Corporation: *See*—
Maxwell, Michael J., 4,571,354, Cl. 428-78.000.

Rogers, Russell L., to Aeroquip Corporation. Tank vent valve. 4,570,657, Cl. 137-39.000.

Rogers, Walter C., Jr., to Parma Corporation. Two-way actuator for reclining chair. 4,570,995, Cl. 297-68.000.

Rogers, Walter C., Jr., to Parma Corporation. Footrest assembly for recliner chairs. 4,570,996, Cl. 297-85.000.

Roggenburg, Stanley L., Jr.; and Laauwe, Robert H., to Essex Chemical Corp. Liquid dispenser. 4,570,827, Cl. 222-95.000.

Rohm and Haas Company: *See*—
Jordan, Arthur D., Jr., 4,571,415, Cl. 524-428.000.
Marks, Allen P., 4,571,420, Cl. 525-350.000.

Roling, Franz; Merten, Gerhard; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mineral mining machine. 4,571,003, Cl. 299-33.000.

Rolls-Royce Limited: *See*—
Smith, Stanley, 4,570,947, Cl. 277-225.000.

Rolscreen Company: *See*—
Minter, Mearl, 4,570,393, Cl. 52-72.000.

Romano, Paul: *See*—
Mathews, Harlan P.; Romano, Paul; and Muckle, Alexander M., 4,571,714, Cl. 369-44.000.

Romano, Paul M.; Baer, James W.; and Hargarten, James W., to Storage Technology Partners II. Beam alignment signal processing. 4,571,712, Cl. 369-44.000.

Root, Richard A.: *See*—
Reimann, Robert C.; and Root, Richard A., 4,570,456, Cl. 62-476.000.

Rose, James W. Mechanic's creeper. 4,570,957, Cl. 280-32.600.

Roseman Mower Corporation: *See*—
Carr, Jack, 4,570,425, Cl. 56-7.000.

Rosenbaum, Stanley D.; and Plett, Calvin, to Northern Telecom Limited. Active impedance line feed circuit with improved ground fault protection. 4,571,460, Cl. 179-16.0AA.

Rosenberg, Farel A. Forward-backward molar controlling and positioning dental appliance. 4,571,178, Cl. 433-18.000.

Rosenberg, Peretz. Flow regulator and spray nozzle including same. 4,570,857, Cl. 239-382.000.

Rosinski, Stephan: *See*—
McGee, Daniel W.; Rosinski, Stephan; and Setzer, Claude S., 4,571,528, Cl. 318-138.000.

Ross, David. Portable vacuum cleaning device. 4,570,286, Cl. 15-327.00C.

Rosser, Michael C., to Production Equipment & Engineering Co. Clamping apparatus for truss manufacturing equipment. 4,570,913, Cl. 269-22.000.

Rossignol, Francois: *See*—
Leblanc, Jean; Pigeroulet, Jean; and Rossignol, Francois, 4,571,161, Cl. 417-499.000.

Rota, Ennio. Retaining device for removable dental prostheses. 4,571,185, Cl. 433-173.000.

Roth, Eric M. One piece lint roller support. 4,570,280, Cl. 15-104.00A.

Roth, Josef, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitting machine with Jacquard guides. 4,570,462, Cl. 66-204.000.

Roth, Kurt: *See*—
Buhler, Ulrich; Stahl, Theo; Mix, Konrad; and Roth, Kurt, 4,571,246, Cl. 8-456.000.

Rotruck, John T.: *See*—
Riley, Dennis P.; Anderson, Mark M.; and Rotruck, John T., 4,571,391, Cl. 514-4.000.

Rottstedt, Hans-Jurgen, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Method of adjusting the inking unit of a printing machine and a measuring device for performing the same. 4,570,539, Cl. 101-426.000.

Rousek, Jaroslav: *See*—
Uebel, Philipp; Rousek, Jaroslav; and Uhlig, Raimer, 4,570,401, Cl. 52-235.000.

Roxton, George F.; and Leibovitz, Howard, to Paratech Incorporated. Unitary multiple control valve assembly. 4,570,677, Cl. 137-881.000.

Roy, Glenn M.: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,571,308, Cl. 260-112.50R.

Ruckman, Stephen E., to Dynatech Computer Power, Inc. Electrical circuit for protection against surge overvoltage of transients. 4,571,656, Cl. 361-56.000.

RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See*—
Smetz, Reinhard; and Speich, H. H., 4,570,305, Cl. 24-68.0CD.

Rudling, Bengt O.: *See*—
Johansson, Leif; Petersson, Stig A.; and Rudling, Bengt O., 4,571,260, Cl. 75-21.000.

Rudnik, Everett. Carrier bearing assembly. 4,571,098, Cl. 384-474.000.

Rudolph, Joachim, to Werner & Pfleiderer. Apparatus for the dewatering and drying of plastic granulate. 4,570,359, Cl. 34-58.000.

Rudszinat, Willy; and Pawelko, Karl-Heinz, to Hauni-Werke Korber & Co. KG. Method of making blanks for use in cigarette packing machines or the like. 4,571,231, Cl. 493-11.000.

Rumley, Stuart D.: *See*—
Schneider, Eric C.; Hebard, Elaine; and Rumley, Stuart D., 4,571,638, Cl. 358-293.000.

Russ, Norman. Door hold. 4,570,984, Cl. 292-18.000.

Russell, Larry R.: *See*—
Evans, John L.; and Russell, Larry R., 4,570,353, Cl. 33-313.000.

Russell, Samuel G., executor: *See*—
Russell, William R.; and Russell, Samuel G., executor, 4,571,679, Cl. 364-300.000.

Russell, William R.; and Russell, Samuel G., executor, to United States of America, Navy. Fault tree data array. 4,571,679, Cl. 364-300.000.

Ruta, Joseph W., to S&C Electric Company. Control circuit for a circuit interrupter. 4,571,658, Cl. 361-96.000.

Rutter, Roger S.: *See*—
Linsker, Ralph; and Rutter, Roger S., 4,571,451, Cl. 174-68.500.
Ryan, Joseph B., Jr.: *See*—
Bintner, Dennis W.; Ryan, Joseph B., Jr.; and Bartel, Mark H., 4,570,858, Cl. 239-390.000.
Ryco Graphic Manufacturing, Inc.: *See*—
Switall, Thomas G., 4,571,092, Cl. 366-348.000.
S&C Electric Company: *See*—
Ruta, Joseph W., 4,571,658, Cl. 361-96.000.
Sacarisen, Stephen P.: *See*—
Stambaugh, Mark A.; Sacarisen, Stephen P.; and Patrick, Michael W., 4,571,675, Cl. 364-200.000.
Sacerdote, Giacomo M., to Ypsilon Limited. Sports racket handle drying device. 4,570,358, Cl. 34-54.000.
Sage, Burton H., Jr.: *See*—
O'Connell, James P.; and Sage, Burton H., Jr., 4,571,388, Cl. 436-63.000.
Saigo, Hiroshi; and Nagamori, Kazuo, to Iwaya Corporation. Toy with swing. 4,571,208, Cl. 446-353.000.
Saint-Gobain Vitrage: *See*—
Kunert, Heinz, 4,571,278, Cl. 156-108.000.
Saito, Koetsu; Kawabuchi, Masami; Yamaguchi, Keisaku; and Iijima, Keiji, to Matsushita Electric Industrial Co. Ltd. Ultrasonic probe having a backing member of microballoons in urethane rubber or thermosetting resin. 4,571,520, Cl. 310-327.000.
Saito, Takeo: *See*—
Isaka, Akihiko; and Saito, Takeo, 4,570,524, Cl. 84-96.000.
Saito, Tsutomu: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; and Saito, Tsutomu, 4,570,594, Cl. 123-414.000.
Saitoh, Keishi, to Canon Kabushiki Kaisha. Amorphus silicon and germanium photoconductive member containing oxygen. 4,571,370, Cl. 430-57.000.
Sakagami, Teruo; Shoji, Masuhiro; Arakawa, Noriyuki; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Substrate capable of adsorbing protein. 4,571,390, Cl. 502-402.000.
Sakai, Hisashi: *See*—
Motosugi, Takanori; and Sakai, Hisashi, 4,571,605, Cl. 346-216.000.
Sakai, Noriyasu: *See*—
Yamada, Toshiro; Sakai, Noriyasu; and Kawase, Hisao, 4,571,367, Cl. 428-653.000.
Sakai, Shinzo: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Aoki, Takashi, 4,570,770, Cl. 192-0.052.
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, to Kabushiki Kaisha Kobe Seiko Sho. Flux cored wire electrodes for self-shielded arc welding. 4,571,480, Cl. 219-146.300.
Sakaida, Atsuo; Kawaura, Masafumi; Chikaoka, Yasuji; Iwata, Hiroshi; and Asano, Kiyomitsu, to Brother Industries, Ltd.; and Nippon Telecommunication Engineering Company. Print head. 4,571,101, Cl. 400-124.000.
Sakakibara, Shinsuke: *See*—
Inaba, Hajimu; Sakakibara, Shinsuke; and Nihei, Ryo, 4,571,694, Cl. 364-513.000.
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Method for manufacturing a rotor for a rotary fluid pump. 4,570,316, Cl. 29-156.80R.
Sakamoto, Hisakazu: *See*—
Ishikura, Takashi; and Sakamoto, Hisakazu, 4,570,543, Cl. 104-300.000.
Sakamoto, Seiichi; and Terauchi, Kiyoshi, to Sanden Corporation. Axial clearance adjustment mechanism for scroll-type fluid displacement apparatus. 4,571,163, Cl. 418-55.000.
Sakamoto, Yushi: *See*—
Suzuki, Setsuo; Morishita, Koji; and Sakamoto, Yushi, 4,571,314, Cl. 264-1.700.
Sakano, Akio: *See*—
Tamaru, Hideshi; Shikakura, Kunio; Kitamura, Nobuo; Yoshida, Kimiyoshi; and Sakano, Akio, 4,571,454, Cl. 178-18.000.
Sakuma, Nobuo, to Ricoh Company, Ltd. Two-element *f*θ lens group capable of correcting leaning of deflecting plane. 4,571,035, Cl. 350-433.000.
Sakurai, Shigenori; Kamo, Takashi; and Ikai, Tadayoshi, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio detector and method of measuring air-fuel ratio. 4,570,479, Cl. 73-116.000.
Sakurai, Yasushi: *See*—
Tanaka, Hiroshi; Mitani, Sotozi; and Sakurai, Yasushi, 4,570,474, Cl. 72-411.000.
Sales Tools, Inc.: *See*—
Lapertosa, Samuel P., 4,571,109, Cl. 402-77.000.
Salvarezza, Robert M. Rat guard. 4,570,564, Cl. 114-221.00R.
Samcoe Holding Corporation: *See*—
Sellers, John R., 4,570,276, Cl. 8-151.000.
Samejima, Shuji: *See*—
Tsuchiya, Takeshi; and Samejima, Shuji, 4,570,946, Cl. 277-216.000.
Sams, Jimmie L. Combined pickup bumper and tool box. 4,570,986, Cl. 293-117.000.
Samson, Rogelio G.; Koller, Paul L.; and Hideg, Laszlo, deceased (by Hideg, Gizella, executrix), to Ford Motor Company. Air assist fuel distributor type fuel injection system. 4,570,598, Cl. 123-445.000.
Samson, Wilfred J.; and Frisbie, Jeffrey S., to Advanced Cardiovascular Systems, Inc. Catheter having encapsulated tip marker. 4,571,240, Cl. 604-96.000.
Sanden Corporation: *See*—
Aoki, Hisao, 4,571,352, Cl. 427-431.000.
Sakamoto, Seiichi; and Terauchi, Kiyoshi, 4,571,163, Cl. 418-55.000.
Sanders Associates, Inc.: *See*—
Baer, Ralph H., 4,571,640, Cl. 358-342.000.
Sanders, Gerald W.: *See*—
Retzloff, James G.; and Sanders, Gerald W., 4,570,720, Cl. 169-39.000.
Sandoz, Inc.: *See*—
Kapa, Prasad K., 4,571,428, Cl. 556-437.000.
Sano, Hideo: *See*—
Matsui, Ichiro; Kobayashi, Hiroaki; and Sano, Hideo, 4,571,124, Cl. 405-239.000.
Sanrio Company, Ltd.: *See*—
Tsuji, Shintaro, 4,570,869, Cl. 242-71.900.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Hoshiba, Akihiko, 4,570,744, Cl. 181-204.000.
Iwashita, Takashi; Suzuki, Hideo; and Nakahama, Ryoji, 4,570,776, Cl. 192-114.00R.
Takada, Yukimitsu; and Karada, Hiroshi, 4,571,193, Cl. 440-77.000.
Santa Fe Pipeline Company: *See*—
Davis, Garland H., 4,570,476, Cl. 73-1.00R.
Sanyo Electric Co., Ltd.: *See*—
Andoh, Toshihiro; Kondo, Tatsuya; and Toguchi, Akira, 4,570,876, Cl. 242-188.000.
Sasai, Takashi: *See*—
Matsubara, Yutaka; Konno, Hisao; and Sasai, Takashi, 4,570,446, Cl. 62-48.000.
Sasaki, Nobuyoshi, to M.C.L. Co., Ltd. Process and autoclave for dewaxing mold for lost wax casting. 4,571,270, Cl. 134-5.000.
Sasaki, Toru: *See*—
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.
Sato, Kazuma: *See*—
Tanizaki, Hiroyuki; Sato, Kazuma; Munakata, Kiyohiko; and Kanazawa, Yuzo, 4,570,997, Cl. 297-349.000.
Sato, Kunihiko, to Toyota Jidosha Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 4,570,596, Cl. 123-421.000.
Sato, Kunio: *See*—
Tadauchi, Masaharu; Sato, Kunio; Tanno, Kiyohiko; Suehiro, Hiroshi; and Inoue, Yasuo, 4,571,573, Cl. 340-347.0AD.
Sato, Masaharu: *See*—
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, 4,571,480, Cl. 219-146.300.
Sato, Nobuhiro; Okada, Akira; and Nakashima, Yutaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,571,362, Cl. 428-329.000.
Sato, Tetsuo: *See*—
Noda, Tsutomu; Iso, Yoshimi; and Sato, Tetsuo, 4,571,572, Cl. 340-347.0DA.
Satoh, Shuichi: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Sauer, Joachim: *See*—
Dittner, Adam; and Sauer, Joachim, 4,571,010, Cl. 303-110.000.
Sauerteig, Wolfgang; Ranz, Erwin; and Schutz, Heinz, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material and development process. 4,571,378, Cl. 430-505.000.
Saunders Archery Company: *See*—
Saunders, Charles A., 4,570,941, Cl. 273-422.000.
Saunders, Charles A., to Saunders Archery Company. Broadhead assembly for arrow. 4,570,941, Cl. 273-422.000.
Saur, Hans, to Matsushita Electric Works, Ltd.; and Saur, Hans. Electromagnetic relay. 4,571,566, Cl. 335-78.000.
Sawayama, Isamu: *See*—
Minamida, Hisatsugu; Kato, Akira; Sawayama, Isamu; and Tanaka, Ken-ichi, 4,571,412, Cl. 524-64.000.
Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Warp feeding device for circular knitting machine. 4,570,460, Cl. 66-135.000.
Sawazaki, Masatoshi, to Precision Fukuhara Works, Ltd. Eyelet and terry knit fabric and method. 4,570,461, Cl. 66-194.000.
Scavuzzo, William S.: *See*—
Klein, Richard B.; and Scavuzzo, William S., 4,571,242, Cl. 604-111.000.
Schaeff, Hans, to Karl Schaeff GmbH & Co. Maschinenfabrik. Shovel excavator with modified upper carriage design. 4,571,147, Cl. 414-694.000.
Schaetti & Co.: *See*—
Schaetti, Josef, 4,571,351, Cl. 427-288.000.
Schaetti, Josef, to Schaetti & Co. Method for coating back-cloth with a powdery synthetic product. 4,571,351, Cl. 427-288.000.
Schapel, Dietmar: *See*—
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,570,622, Cl. 128-90.000.
Schaphorst, Richard A.; and Bodson, Charles D., to United States of America, Army. Alternate line interpolation method and apparatus. 4,571,632, Cl. 358-260.000.
Scharl, Werner, to Siemens Aktiengesellschaft. Mounting for an especially current-compensated, ferrite ring-core choke. 4,571,569, Cl. 336-65.000.
Scheffler, Michael: *See*—
Nestlen, Wolfgang; and Scheffler, Michael, 4,571,567, Cl. 335-128.000.

Schell, Ellen C., administrator: *See—*
Schell, James E., deceased; Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., 4,571,291, Cl. 204-213.000.
Schell, James E., deceased (by Schell, Ellen C., administrator); Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., to Alumatec, Inc. Apparatus for the electrodeposition of metal. 4,571,291, Cl. 204-213.000.
Schenk, Hanspeter, to Givaudan Corporation. Flavorants containing esters of 2,3,6,6-tetramethylcyclohexenyl carboxylic acids. 4,570,648, Cl. 131-276.000.
Schering AG: *See—*
Drawert, Manfred; and Krase, Horst, 4,571,267, Cl. 106-27.000.
Schering Corporation: *See—*
Sunday, Brooks R.; and Witkowski, Joseph T., 4,571,402, Cl. 514-336.000.
Scheuerman, Curtis H.: *See—*
Burke, Thomas A.; and Scheuerman, Curtis H., 4,570,668, Cl. 137-512.200.
Schiebel, Ulrich, to U.S. Philips Corporation. Method of and device for the electrophotographic printing of information. 4,571,604, Cl. 346-161.000.
Schiebl, Antonin: *See—*
Sitta, Jaroslav; and Schiebl, Antonin, 4,570,504, Cl. 74-411.000.
Schippl, Klaus, to Kabelmetal Electro GmbH. Conduction of low temperature fluid. 4,570,679, Cl. 138-149.000.
Schippl, Klausdieter: *See—*
Ziemek, Gerhard; and Schippl, Klausdieter, 4,570,678, Cl. 138-113.000.
Schlodder, Rainer: *See—*
Konig, Karl-Heinz; Schuster, Michael; Hollmann, Dieter; and Schlodder, Rainer, 4,571,265, Cl. 75-108.000.
Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, 4,571,266, Cl. 75-108.000.
Schlosser, Cynthia M. Strand garment and method of fabricating same. 4,570,266, Cl. 2-69.000.
Schmanski, Donald W., to Carsonite International Corporation. Simulated tubular highway safety device. 4,571,118, Cl. 404-10.000.
Schmidt, Herbert, to ITT Industries, Inc. Apparatus for sealing the guide pin of a floating-caliper spot-type disc brake. 4,570,760, Cl. 188-73.440.
Schmidt, Parbury P.: *See—*
Taylor, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., 4,571,335, Cl. 424-131.000.
Schmied, Kurt, to Daimler-Benz Aktiengesellschaft. Self-cleaning fuel injection valve. 4,570,853, Cl. 239-116.000.
Schneeweis, Gerd: *See—*
Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, 4,571,266, Cl. 75-108.000.
Schneider, Eric C.; Hebard, Elaine; and Rumley, Stuart D., to Datacopy Corporation. Random-access electronic camera. 4,571,638, Cl. 358-293.000.
Schneider, Gottfried: *See—*
Peschka, Walter; Schneider, Gottfried; and Nieratschker, Willi, 4,570,578, Cl. 123-1.00A.
Schneiter, Ali, to Ebauches, S.A. Electromagnetic motor. 4,571,516, Cl. 310-49.00R.
Schoener, Gilbert P., to Branick Industries, Inc. Spanner wrench for use with a Macpherson strut retaining nut or the like. 4,570,514, Cl. 81-129.000.
Schoenhard, James D., to International Technology Services. Road levelling oil squeegee. 4,571,120, Cl. 404-101.000.
Scholten, Heinz: *See—*
Muller, Wolfgang H. E.; Boxkes, Werner; and Scholten, Heinz, 4,571,284, Cl. 203-14.000.
Schoon, David J., to Minnesota Mining and Manufacturing Company. Data clocking circuitry. 4,571,623, Cl. 358-208.000.
Schraufnagel, Richard A., to Atlantic Richfield Company. Process for reducing the bound water content of coal. 4,571,300, Cl. 210-761.000.
Schroeder, Albert. Positive damper adjustment device and methods of making and using the same. 4,570,611, Cl. 126-288.000.
Schroit, Alan J.; and Fidler, Isaiah J., to Litton Bionetics, Inc. ^{125}I and ^{131}I labeled phospholipids. 4,571,332, Cl. 424-1.100.
Schuelke, Richard D.: *See—*
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., 4,571,645, Cl. 360-98.000.
Schulman, Marvin: *See—*
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.
Schuster, Charles E.: *See—*
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Schuster, Michael: *See—*
Konig, Karl-Heinz; Schuster, Michael; Hollmann, Dieter; and Schlodder, Rainer, 4,571,265, Cl. 75-108.000.
Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, 4,571,266, Cl. 75-108.000.
Schutten, Herman P.; Benjamin, James A.; and Lade, Robert W., to Eaton Corporation. Lateral bidirectional shielded notch FET. 4,571,512, Cl. 307-577.000.
Schutten, Herman P.: *See—*
Benjamin, James A.; Lade, Robert W.; Schutten, Herman P.; and Jaskolski, Stanley V., 4,571,606, Cl. 357-23.400.
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Schutz, Heinz: *See—*
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Schwind, Richard J.: *See—*
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Scuderi, Richard. Sun lotion applicator. 4,571,106, Cl. 401-209.000.
Seagrave, Earl M.; and Machen, Edmond H., to Fusion UV Curing Systems Corporation. Apparatus for applying UV ink to glass fibers. 4,570,571, Cl. 118-642.000.
Sealed Power Corporation: *See—*
Mullally, Charles J., 4,570,904, Cl. 251-129.210.
Sealtran Corporation: *See—*
Drower, Herbert M., 4,570,866, Cl. 242-47.500.
Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The: *See—*
Griffin, Eric J.; and Slack, Gordon J., 4,571,545, Cl. 324-58.00B.
Seelbach, Christian A.: *See—*
Price, J. B.; Tobin, Philip J.; Pintchovski, Fabio; and Seelbach, Christian A., 4,570,328, Cl. 29-571.000.
Seeley, Frederic F., to F. F. Seeley Nominees Pty. Ltd. Cooler case construction. 4,570,814, Cl. 220-4.00F.
Segero, Tommy S., to Telefonaktiebolaget L M Ericsson. Electret microphone. 4,571,464, Cl. 179-111.00E.
Seike, Shoji: *See—*
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Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method of preparing 2-chloroethyldichlorosilanes. 4,571,427, Cl. 556-476.000.
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, to Fujitsu Limited. Decoder circuit. 4,571,510, Cl. 307-449.000.
Sekiguchi, Tomozo, to Pentel Kabushiki Kaisha. Lead engaging chuck mechanism for mechanical pencil. 4,571,105, Cl. 401-65.000.
Selina, John: *See—*
Antos, John M.; and Selina, John, 4,570,273, Cl. 4-321.000.
Sellers, John R., to Samcoe Holding Corporation. Method for pad batch dyeing of tubular knitted cotton fabrics. 4,570,276, Cl. 8-151.000.
Semiconductor Energy Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,571,446, Cl. 136-244.000.
Senba Machinery Co. Ltd.: *See—*
Senba, Rikichi, 4,570,556, Cl. 112-121.150.
Senba, Rikichi, to Senba Machinery Co. Ltd. Automatic seaming method and apparatus for gored panty-hoses. 4,570,556, Cl. 112-121.150.
Seragnoli, Enzo, to G. D. Societa' per Azioni. Method for transferring cigarette pieces. 4,570,643, Cl. 131-94.000.
Serna, Jaime, to Mattel, Inc. Modular toy building set. 4,571,200, Cl. 446-85.000.
Service National Electricite de France: *See—*
Baumaire, Alain; Desmas, Thierry; and Vambenepe, Guy, 4,570,489, Cl. 73-658.000.
Seshimoto, Osamu; and Nirasawa, Mitsuharu, to Fuji Photo Film Co., Ltd. Ion selective electrode and method of preparation thereof. 4,571,293, Cl. 204-418.000.
Setterberg, John R., Jr., to Otis Engineering Corporation. Releasable latch for downhole well tools. 4,570,707, Cl. 166-214.000.
Setzer, Claude S.: *See—*
McGee, Daniel W.; Rosinski, Stephan; and Setzer, Claude S., 4,571,528, Cl. 318-138.000.
Severin, William A.: *See—*
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Sevostyanova, Valentina V., Alexandr S. Novikov, Sergei S. Novikov, administrators: *See—*
Zimakova, Irina E.; Valimukhame'ova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Shafer, David: *See—*
Gebelein, Rolin J.; and Shafer, David, 4,571,036, Cl. 350-503.000.
Shah, Tushar K.: *See—*
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,570,702, Cl. 165-159.000.
Shank, Spencer L. System for teaching coin relationships. 4,571,189, Cl. 434-110.000.
Sharp Kabushiki Kaisha: *See—*
Hara, Takafumi, 4,571,600, Cl. 346-140.00R.
Nishibori, Toshiki, 4,570,920, Cl. 271-107.000.
Nishiyama, Haruo, 4,571,055, Cl. 355-3.0SH.
Nishiyama, Haruo, 4,571,067, Cl. 355-14.0SH.
Yamauchi, Yutaka, 4,570,332, Cl. 29-586.000.
Shasta Industries, Inc.: *See—*
Gould, Charles M.; and Blake, Andy F., 4,570,663, Cl. 137-119.000.

Shaw, Douglas N., to Houdaille Industries, Inc. Tool having a multi-positional handle. 4,570,340, Cl. 30-123.000.

Shaw, Thomas M.: *See*—
Wooten, John R.; Walter, Robert J.; and Shaw, Thomas M., 4,571,086, Cl. 366-127.000.

Shefler, Gerald E., to Code-A-Phone Corporation. Method and system for automatically inserting at least one pause into means for memorizing a dialing sequence. 4,571,463, Cl. 179-90.00B.

Shell Oil Company: *See*—
Falls, Andrew H.; Lawson, Jimmie B.; and Hirasaki, George J., 4,570,711, Cl. 166-272.000.
Slaugh, Lynn H., 4,571,445, Cl. 585-852.000.
Van Meurs, Peter; and Van Egmond, Cor F., 4,570,715, Cl. 166-302.000.
Vinegar, Harold J.; and Wellington, Scott L., 4,571,491, Cl. 250-252.100.

Shelton, Walter W., to Atlantic Richfield Company. Method for drying particulate law rank coal in a fluidized bed. 4,571,174, Cl. 432-14.000.

Sherritt Gordon Mines Limited: *See*—
Kerfoot, Derek G. E.; Kofluk, Russell P.; and Weir, Donald R., 4,571,262, Cl. 75-101.00R.
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,571,263, Cl. 75-101.00R.
Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., 4,571,264, Cl. 75-101.00R.

Sherrow, Lionel, to Budd Company, The. Connecting means for a stanchion in a railway car. 4,570,545, Cl. 105-354.000.

Sherwin Williams Company, The: *See*—
Frain, Laura M.; and Petkus, Paul A., 4,571,268, Cl. 106-1.170.

Sherwood, Edward F.: *See*—
Orndorff, Karl B.; and Sherwood, Edward F., 4,570,754, Cl. 187-1.00R.

Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, to Diesel Kiki Co., Ltd. Vane compressor with vane back pressure adjustment. 4,571,164, Cl. 418-76.000.

Shikakura, Kunio: *See*—
Tamaru, Hideshi; Shikakura, Kunio; Kitamura, Nobuo; Yoshida, Kimiyoshi; and Sakano, Akio, 4,571,454, Cl. 178-18.000.

Shima, Yoshiharu; Miyahara, Masaaki; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, to Nissei Plastics Industrial Co., Ltd. Mold clamp apparatus for molding machine. 4,571,169, Cl. 425-451.900.

Shimamura, Isao: *See*—
Harada, Toru; Hirano, Shigeo; Nakamura, Shigeru; and Shimamura, Isao, 4,571,376, Cl. 430-218.000.

Shimano Industrial Company Limited: *See*—
Nakajima, Hideki, 4,570,878, Cl. 242-220.000.

Shimanuki, Koji: *See*—
Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, 4,571,624, Cl. 358-212.000.

Shimokawa, Toshiaki: *See*—
Okonogi, Shigeo; Kuwahara, Kunisuke; Tanaka, Katsushige; Iwatsuki, Keiji; Shimokawa, Toshiaki; and Matsuzaki, Masaru, 4,571,338, Cl. 426-324.000.

Shimosaki, Ryuji: *See*—
Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, 4,571,379, Cl. 430-534.000.

Shimoyama, Yuji: *See*—
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.

Shimura, Takai: *See*—
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.

Shin Nisso Kako Co., Ltd.: *See*—
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; and Fuzikawa, Kazuhiko, 4,571,310, Cl. 260-973.000.

Shinagawa, Kiminari: *See*—
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.

Shinhan Kongki Co. Ltd.: *See*—
Han, Eui M., 4,570,497, Cl. 73-861.790.

Shinozaki, Michio; and Yoshida, Kaneki, to Toppan Printing Co., Ltd. Thermal head. 4,571,598, Cl. 346-76.0PH.

Shiojiri, Hiroyuki: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.

Shiosaki, Tadashi: *See*—
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Shiozaki, Minoru: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.

Shirai, Masaharu, to Fuji Xerox Co., Ltd. Electric field transfer method and apparatus. 4,571,052, Cl. 355-3.0TR.

Shiraishi, Hisayoshi: *See*—
Azusawa, Noboru; and Shiraishi, Hisayoshi, 4,571,668, Cl. 363-81.000.

Shiraishi, Minoru: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.

Shiroshita, Yoshihira: *See*—
Ishibashi, Kiyoshi; Ukai, Yujiro; Mita, Hideo; and Shiroshita, Yoshihira, 4,570,445, Cl. 62-6.000.

Shoemaker, Nancy A., to Trim, Inc. Plastic exercising device and its method of manufacture. 4,570,929, Cl. 272-137.000.

Shoenfeld, David B., to Federal Express Corporation. Overnight package. 4,570,416, Cl. 53-415.000.

Shoji, Masuhiro: *See*—
Sakagami, Teruo; Shoji, Masuhiro; Arakawa, Noriyuki; and Murayama, Naohiro, 4,571,390, Cl. 502-402.000.

Shorrock, Peter: *See*—
Cox, Gordon C.; and Shorrock, Peter, 4,570,839, Cl. 227-1.000.

Shroder, Joseph D.: *See*—
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Shupert, Paul T.: *See*—
Dushenko, Michael D.; Castner, Harvey R.; Baugh, Robert T.; and Shupert, Paul T., 4,570,806, Cl. 211-191.000.

Sieben, James A.: *See*—
Johnson, Ronald R.; Gysling, Walter; Burns, David C.; Schuelke, Richard D.; and Sieben, James A., 4,571,645, Cl. 360-98.000.

Siebert, Hans W.: *See*—
Legerius, Bengt E.; and Siebert, Hans W., 4,570,323, Cl. 29-451.000.

Siemens Aktiengesellschaft: *See*—
Distler, Walter; and Peter, Fritz, 4,571,495, Cl. 250-394.000.
Maegdefessel, Heinz, 4,571,158, Cl. 417-51.000.
Murawski, Peter; and Mayer, Wolfgang, 4,570,565, Cl. 178-2.00R.
Richter, Martin; and Schweiger, Josef, 4,570,336, Cl. 29-838.000.
Scharl, Werner, 4,571,569, Cl. 336-65.000.
Vogelsberg, Dieter; and Feese, Wolfgang, 4,570,432, Cl. 57-293.000.
Zagler, Wolfgang; and Oberleitner, Wolfgang, 4,571,190, Cl. 434-114.000.

Sierk, Randall L.: *See*—
Kline, Charles M.; and Sierk, Randall L., 4,570,730, Cl. 180-6.480.

Sigmon, Bernard E.; and Evans, Charles V., to Motorola, Inc. Re-entrant coaxial cavity power combiner. 4,571,555, Cl. 331-56.000.

Silo S.p.A.: *See*—
Compagnucci, Rossano, 4,570,871, Cl. 242-77.200.

Silva, James M., to General Electric Company. Method for making aromatic bis(ether anhydride). 4,571,425, Cl. 549-241.000.

Silverman, Gordon; and Brudny, Joseph, to Computerized Sports Equipment, Inc. System and method for skill enhancement and behavior modification. 4,571,682, Cl. 364-413.000.

Silverman, Harold: *See*—
Hooper, Clinton E.; and Silverman, Harold, 4,570,923, Cl. 271-275.000.

Silvis, Salvatore J., to Colgate-Palmolive Company. Continuous extraction apparatus. 4,571,299, Cl. 210-511.000.

Simmonds S.A.: *See*—
Martin, Joel; and Boire, Maxime, 4,571,135, Cl. 411-85.000.

Simpson, James K. Anti-twist control system for deviated conductor driving systems. 4,570,717, Cl. 166-362.000.

Simpson, Roy G., to Adams Plastics, Inc. Cinch for a western saddle. 4,570,424, Cl. 54-23.000.

Singer, Gerhard: *See*—
Nowak, Franz; Gietl, Albert; Leo, Rolf; and Singer, Gerhard, 4,571,005, Cl. 301-63.0PW.

Singfield, Peter, to Dicore Resources, Ltd. Mechanisms to heat fluids to higher temperatures and pressures. 4,571,484, Cl. 219-271.000.

Sipila, Heikki J.; and Jarvinen, Marja-Leena, to Outokumpu Oy. Way to prolong the service life of proportional counters. 4,571,196, Cl. 445-53.000.

Sirota, Vladimir. Cigarette. 4,570,650, Cl. 131-349.000.

Sitta, Jaroslav; and Schiebl, Antonin, to Zavody silnoproude elektrotechniky koncern Praha MEZ Mohelnice, koncernovy podnik. Automatically disengageable gearing. 4,570,504, Cl. 74-411.000.

Skeldon, Mark D., to United States of America, Army. Laser-testing scatterferometer. 4,571,077, Cl. 356-239.000.

Skelton, Alan W. Wire rope cleaning devices. 4,570,285, Cl. 15-256.600.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Haas, Roland; Hans, Rudiger; and Friedrich, Wolfgang, 4,571,222, Cl. 474-112.000.
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,570,773, Cl. 192-98.000.

SKF Steel Engineering AB: *See*—
Tiberg, Jan, 4,570,708, Cl. 166-244.100.

Skogberg, Bo T.: *See*—
Granstrom, Bengt P. O.; and Skogberg, Bo T., 4,571,126, Cl. 405-244.000.

Skotheim, Terje A.; O'Grady, William E.; and Linkous, Clovis A., to United States of America, Energy. Electro-optical switching and memory display device. 4,571,029, Cl. 350-357.000.

Skoworodko, Mike. Universal joint dismantler. 4,570,319, Cl. 29-259.000.

Skupnjak, Joseph A.; Lee, Douglas J.; and Becker, Neil J., to Intel Corporation. Timing apparatus for non-volatile MOS RAM. 4,571,709, Cl. 365-233.000.

Slack, Gordon J.: *See*—
Griffin, Eric J.; and Slack, Gordon J., 4,571,545, Cl. 324-58.00B.
Slager, Richard E.; and Balinski, Henry A., to United States Gypsum Company. Curtain wall stud slide clip. 4,570,400, Cl. 52-235.000.
Slaugh, Lynn H., to Shell Oil Company. Process for removal of sulfur compounds from conjugated diolefins. 4,571,445, Cl. 585-852.000.
Sloan Valve Company: *See*—
Billeter, Henry R., deceased, 4,570,763, Cl. 188-196.00D.
Slocum, Chester D.; and Batty, John R., Jr., to Cordis Corporation. Biomedical implant with high speed, low power two-way telemetry. 4,571,589, Cl. 340-870.320.
Smetz, Reinhard; and Speich, H. H., to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Tensioning device for tensioning lines, particularly chains or belts. 4,570,305, Cl. 24-68.0CD.
Smith, Alan K.; and Alexander, Stephen R. Wide angled gun magazine entrance guide opening. 4,570,370, Cl. 42-90.000.
Smith, Gary A., to Honeywell Inc. Economizer control apparatus. 4,570,448, Cl. 62-89.000.
Smith, Gilbert C.; and Cann, Bruce J. Cover for butt-hinges. 4,570,291, Cl. 16-250.000.
Smith International, Inc.: *See*—
Ogden, Charles A., 4,571,128, Cl. 408-1.00R.
Smith, Irving. Foldable display stand. 4,570,805, Cl. 211-149.000.
Smith, Jack L. Push-pull swing. 4,570,928, Cl. 272-87.000.
Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H., 4,571,398, Cl. 514-259.000.
Smith, Larry L.: *See*—
Criqui, William D.; and Smith, Larry L., 4,570,835, Cl. 224-36.000.
Smith, Peter H.; and Dills, Raymond L., to General Electric Company. Apparatus and method for production line leakage testing of microwave oven cavities. 4,571,581, Cl. 340-600.000.
Smith, Roy E., to Urban Transportation Development Corp. Ltd. Diagonally braced rail truck. 4,570,544, Cl. 105-165.000.
Smith, Stanley, to Rolls-Royce Limited. Gas sealing and fluid scavenge apparatus. 4,570,947, Cl. 277-225.000.
Smith, Steven R.; and Solomon, James S., to University of Dayton, The. Stable ohmic contacts for gallium arsenide semiconductors. 4,570,324, Cl. 29-576.00B.
Smith, William N.: *See*—
Kulesza, Ralph J.; Disko, Harry; Cook, Stuart A.; Newton, Jean M.; and Smith, William N., 4,571,197, Cl. 446-6.000.
Smyth, Richard E., to Ainsworth Hominees Pty. Ltd. Poker machines. 4,570,934, Cl. 273-143.00R.
Snaper, Alvin A. Fluidially controlled fuel system. 4,570,597, Cl. 123-444.000.
Sobanski, Kurt J.: *See*—
Hildebrand, James R.; and Sobanski, Kurt J., 4,571,689, Cl. 364-481.000.
Sobue, Hideo, to NGK Spark Plug Co., Ltd. Piezo-electric level sensor for internal combustion engine. 4,570,483, Cl. 73-290.00V.
Societa' Cavi Pirelli S.p.A.: *See*—
Giubileo, Giancarlo, 4,571,452, Cl. 174-77.00R.
Societe Anonyme de Telecommunications: *See*—
Lods, Jean; and Trinh Van, Christian, 4,571,549, Cl. 332-16.00R.
Societe Nationale Industriele et Aerospatiale: *See*—
Martin, Joel; and Boire, Maxime, 4,571,135, Cl. 411-85.000.
Societe Technisynthese s.a.r.l.: *See*—
Vermonet, Christian, 4,570,362, Cl. 36-59.00C.
Sokalski, Robert G., to Eaton Corporation. Liquid measurement system. 4,570,484, Cl. 73-301.000.
Solomon, James S.: *See*—
Smith, Steven R.; and Solomon, James S., 4,570,324, Cl. 29-576.00B.
Somanetics Corporation: *See*—
Stoddart, Hugh F.; and Lewis, Gary D., 4,570,638, Cl. 128-665.000.
Someya, Atsushi; and Suda, Shigeyuki, to Canon Kabushiki Kaisha. Zoom lens. 4,571,032, Cl. 350-427.000.
Sommer & Maca Industries, Inc.: *See*—
Lewanski, Richard M.; and Buggele, Norman R., 4,570,785, Cl. 198-628.000.
Sonoda, Satoshi: *See*—
Take, Tokio; Sonoda, Satoshi; and Yamamoto, Takayuki, 4,570,593, Cl. 123-398.000.
Sony Corporation: *See*—
Maruta, Keiji, 4,571,026, Cl. 350-247.000.
Suzuki, Yoshio, 4,571,584, Cl. 340-784.000.
Takise, Tadashi, 4,570,742, Cl. 181-175.000.
Tamaru, Hideshi; Shikakura, Kunio; Kitamura, Nobuo; Yoshida, Kimiyoshi; and Sakano, Akio, 4,571,454, Cl. 178-18.000.
Wilkinson, James H., 4,571,546, Cl. 328-61.000.
Soong, David S., to University of California, The Regents of The. Concentric-cylinder rheometer. 4,570,478, Cl. 73-60.000.
Sorenson, Richard W.; and Ives, Milton N., to Carlingswitch, Inc. Three position center-off electrical switch. 4,571,467, Cl. 200-6.0BA.
Soroka, Daniel P.; and Stoutamire, Mark S., to Westinghouse Electric Corp. General purpose orthogonal axes manipulator system. 4,571,149, Cl. 414-750.000.
Sosebee, Robert J.: *See*—
Harben, Grover S., Jr.; and Sosebee, Robert J., 4,570,293, Cl. 17-11.000.
Southco, Inc.: *See*—
Keogh, Kenneth D., 4,571,111, Cl. 403-282.000.
Southern Gas Association: *See*—
Sparks, Cecil R.; and Damewood, Glenn, 4,570,745, Cl. 181-228.000.
Southwest Medical Products, Inc.: *See*—
Raymond, Leonard S.; and Jewett, Warren R., 4,571,543, Cl. 324-425.000.
Southwest Research Institute: *See*—
Gruber, George J., 4,570,487, Cl. 73-624.000.
Southwestern Products, Inc.: *See*—
Curtis, Joel E., 4,570,812, Cl. 220-1.00T.
Souza, John A.; and Souza, Ross P. Self-interlocking split saw blade. 4,570,517, Cl. 83-838.000.
Souza, Ross P.: *See*—
Souza, John A.; and Souza, Ross P., 4,570,517, Cl. 83-838.000.
Sparks, Cecil R.; and Damewood, Glenn, to Southern Gas Association. Method and apparatus for minimizing pulsations in fluid transmission systems. 4,570,745, Cl. 181-228.000.
Specht, Manfred, to Ytong AG. Method for the steam treatment of several autoclaves and apparatus for its implementation. 4,570,443, Cl. 60-670.000.
Spector, Donald. Cube type aroma generator. 4,571,485, Cl. 219-276.000.
Speich, H. H.: *See*—
Smetz, Reinhard; and Speich, H. H., 4,570,305, Cl. 24-68.0CD.
Speil, Walter, to Motomak Motorenbau, Machinen-und Werkzeugfabrik Konstruktionen GmbH. Inner element for a hydraulic valve play compensating element. 4,570,582, Cl. 123-90.460.
Spencer, Herbert W., III: *See*—
Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., 4,571,330, Cl. 423-242.000.
Sperry Corporation: *See*—
Kline, Charles M.; and Sierk, Randall L., 4,570,730, Cl. 180-6.480.
Spinelli, Bartel L.: *See*—
Newcom, William F.; and Spinelli, Bartel L., 4,570,783, Cl. 198-347.000.
Sprague, Janice S.: *See*—
Finch, Jack N.; and Sprague, Janice S., 4,571,269, Cl. 106-273.00R.
Springer, Harvey G.: *See*—
Mayer, John F.; Cook, Stuart A.; Springer, Harvey G.; and Wood, Earl M., Jr., 4,571,206, Cl. 446-330.000.
Staeubli, Hugo. Catheter valve. 4,570,898, Cl. 251-4.000.
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., to Chicago Bridge & Iron Company. Shell and tube vertical heat exchanger with sleeves around the tubes. 4,570,702, Cl. 165-159.000.
Stahl, Theo: *See*—
Buhler, Ulrich; Stahl, Theo; Mix, Konrad; and Roth, Kurt, 4,571,246, Cl. 8-456.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Yarn piecing arrangement for an open-end friction spinning machine. 4,570,430, Cl. 57-263.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Fiber feed arrangement for open-end friction spinning. 4,570,434, Cl. 57-401.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Fiber feed channel arrangement for an open-end friction spinning machine. 4,570,435, Cl. 57-401.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,570,430, Cl. 57-263.000.
Stahlecker, Fritz, 4,570,434, Cl. 57-401.000.
Stahlecker, Fritz, 4,570,435, Cl. 57-401.000.
Stambaugh, Mark A.; Sacarisen, Stephen P.; and Patrick, Michael W., to Texas Instruments Incorporated. Microprocessor device with integrated auto-loaded timer. 4,571,675, Cl. 364-200.000.
Standard-Knapp, Inc.: *See*—
Raudat, John L., 4,570,413, Cl. 53-247.000.
Standard Oil Company, The: *See*—
DiCosimo, Robert; Burrington, James D.; and Grasselli, Robert K., 4,571,443, Cl. 585-428.000.
Standard Oil Company (Ohio), The: *See*—
Ward, Michael D.; Brazdil, James F., Jr.; and Grasselli, Robert K., 4,571,290, Cl. 204-157.690.
Standard Telephones and Cables plc: *See*—
Conquest, Alexander R.; and Powling, Christopher F., 4,571,662, Cl. 361-306.000.
Vance, Ian A. W., 4,571,738, Cl. 375-82.000.
Stanforth, Charles M.: *See*—
Fenwick, Danny L.; and Stanforth, Charles M., 4,570,675, Cl. 137-805.000.
Stangel, John J.: *See*—
Valentino, Pasquale A.; Stangel, John J.; and Donelin, Dwayne D., 4,571,591, Cl. 343-754.000.
Star, Leon D. Mobile hospital unit. 4,570,733, Cl. 180-41.000.
State of Oregon acting by and through the State Board of Higher Education on behalf of Oregon State University: *See*—
Morita, Richard Y.; and Jones, Ronald D., 4,571,384, Cl. 435-167.000.
Stauffer Chemical Company: *See*—
Leone-Bay, Andrea; and Timony, Peter E., 4,571,257, Cl. 71-92.000.
Telschow, Jeffrey E., 4,571,432, Cl. 562-495.000.
Steelcase, Inc.: *See*—
Whitwam, Ronald L.; and Pergler, Charles C., 4,570,895, Cl. 248-575.000.
Steele, Scott W.: *See*—
Chang, Long F.; and Steele, Scott W., 4,571,173, Cl. 432-9.000.
Stefanini, Giancarlo. Multiple maze game. 4,570,935, Cl. 273-153.00R.
Stein, Charles R.; and Bigelow, John E., to General Electric Company. Matrix addressing of cholesteric liquid crystal display. 4,571,585, Cl. 340-784.000.

Steinbrech, Bernd: *See—*
Konig, Karl-Heinz; Schuster, Michael; Schneeweis, Gerd; Steinbrech, Bernd; and Schlodder, Rainer, 4,571,266, Cl. 75-108.000.
Steinkuhl, Bernd: *See—*
Roling, Franz; Merten, Gerhard; and Steinkuhl, Bernd, 4,571,003, Cl. 299-33.000.
Stempeck, John W., to Polaroid Corporation. Electronic viewfinder. 4,571,627, Cl. 358-224.000.
Stenlund, Stig, to Hypeco AB. Grounding protective device for boats. 4,570,563, Cl. 114-140.000.
Stephen, Robert V. Reflective system for bicycles. 4,571,025, Cl. 350-99.000.
Stern, Jay L.: *See—*
Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., 4,571,330, Cl. 423-242.000.
Sterner, Maurice E., Jr., to Product Design & Development, Inc. Single plane window or door structure. 4,570,381, Cl. 49-129.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Herdin, Gunther H.; and Hack, Walter, 4,570,588, Cl. 123-198.0DB.
Stiansen & Oya A/S: *See—*
Oya, Anders, 4,570,367, Cl. 37-232.000.
Stieg, Richard F.; Dolan, John P.; Worley, Wm. Spencer; and Gerbert, Goran, to Gates Rubber Company, The. Variable speed belt driven transmission system and method. 4,571,216, Cl. 474-8.000.
Stockmeier, Glenn R.; and Treiber, Fritz F., to Hobart Corporation. Dropped-package catcher. 4,570,412, Cl. 53-167.000.
Stoddart, Hugh F.; and Lewis, Gary D., to Somanetics Corporation. Method and apparatus for spectral transmissibility examination and analysis. 4,570,638, Cl. 128-665.000.
Stoffels, Johannes, to B.V. Enraf-Nonius Delft. Apparatus for measuring a temperature. 4,571,095, Cl. 374-167.000.
Stokes, Gilbert A. Tennis ball throwing machine with continuously rotatable barrel having friction strip on one side only of inner wall. 4,570,607, Cl. 124-56.000.
Stopanski chimitcheski Kombinat "Gavril Genov", Russe: *See—*
Nikolov, Valentin A.; Klissurski, Dimiter G.; and Jurov, Boyan M., 4,571,325, Cl. 422-191.000.
Storage Technology Partners II: *See—*
Mathews, Harlan P.; Romano, Paul; and Muckle, Alexander M., 4,571,714, Cl. 369-44.000.
Romano, Paul M.; Baer, James W.; and Hargarten, James W., 4,571,712, Cl. 369-44.000.
Stork PMT B.V.: *See—*
van Mil, Martinus P. G., 4,570,295, Cl. 17-11.000.
Stosberg, Arturo E.: *See—*
Studer, Willi; and Stosberg, Arturo E., 4,571,529, Cl. 318-327.000.
Stoutamire, Mark S.: *See—*
Soroka, Daniel P.; and Stoutamire, Mark S., 4,571,149, Cl. 414-750.000.
Stover, Gary L., to Economy Label Sales, Inc. Label for plants and nursery stock. 4,570,368, Cl. 40-10.00C.
Stowe, Lawrence R., to Mobil Oil Corporation. Method for preventing wellbore damage due to fines migration. 4,570,710, Cl. 166-250.000.
Stowers, Jeffery P.; and Moore, Thomas W., to Virginia Panel Corporation. Electrical contact probe. 4,571,540, Cl. 324-158.00P.
Stranahan, Phillip: *See—*
Heimbigner, Thomas; and Stranahan, Phillip, 4,570,952, Cl. 279-20.000.
Strand, Kevin O., to Erickson Tool Company. Mandrel assembly. 4,571,129, Cl. 408-54.000.
Strickland, James K.; and Ivey, H. Grady, to Strickland Systems, Inc. Slide action inside corner form. 4,570,896, Cl. 249-27.000.
Strickland Systems, Inc.: *See—*
Strickland, James K.; and Ivey, H. Grady, 4,570,896, Cl. 249-27.000.
Stroklund, Jerald K. Wild game trap. 4,570,375, Cl. 43-85.000.
Struben, Francis L. Roof structure for mobile homes. 4,570,396, Cl. 52-90.000.
Studer, Willi; and Stosberg, Arturo E., to Willi Studer, AG. Actual speed value converter for the speed control in a motor drive system. 4,571,529, Cl. 318-327.000.
Stull, Gene. Tamper-evident cap construction. 4,570,825, Cl. 222-45.000.
Subotics, Gyula: *See—*
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, 4,570,964, Cl. 280-403.000.
Suda, Masao: *See—*
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Suda, Shigeyuki: *See—*
Someya, Atsushi; and Suda, Shigeyuki, 4,571,032, Cl. 350-427.000.
Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Klaucke, Thomas; and Pigisch, Franz, 4,570,849, Cl. 236-35.000.
Suehiro, Hiroshi: *See—*
Tadauchi, Masaharu; Sato, Kunio; Tanno, Kiyohiko; Suehiro, Hiroshi; and Inoue, Yasuo, 4,571,573, Cl. 340-347.0AD.
Suematsu, Kohshi: *See—*
Urawa, Motoo; Takenouchi, Masanori; Kan, Fumitaka; Suematsu, Kohshi; and Imai, Eiichi, 4,571,372, Cl. 430-122.000.
Suess, Jack E., to Newell Mfg. Co., a Division of Citation-Walthers Co. Friction balance and jamb liner for window sash. 4,570,382, Cl. 49-430.000.
Suffi, Louis; and Burtelson, Frederick W., to Northern Telecom Limited. Connector for cable shields. 4,571,013, Cl. 339-14.00R.
Suga, Tetsuo: *See—*
Sakai, Yoshiya; Nagai, Yasuhiro; Ikemoto, Kazuo; Suga, Tetsuo; and Sato, Masaharu, 4,571,480, Cl. 219-146.300.
Sugawara, Norio; and Nawa, Motoyuki, to Matsushita Electric Industrial Co., Ltd. Fluid deflecting assembly. 4,570,533, Cl. 98-40.240.
Sugawara, Saburo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing system of photographic camera. 4,571,048, Cl. 354-403.000.
Sugibuchi, Hiroyuki, to Junkosha Company Ltd. Leak detecting cable. 4,570,477, Cl. 73-40.50R.
Sugihara, Jiro: *See—*
Goto, Shobun; Sugihara, Jiro; and Yabusaki, Masayoshi, 4,571,167, Cl. 425-289.000.
Sugimura, Tsuyoshi. Process for continuous rice cooking by steaming and apparatus therefor. 4,571,341, Cl. 426-510.000.
Sugishita, Susumu: *See—*
Sakamaki, Hiroshi; Sugishita, Susumu; and Horikoshi, Yukio, 4,570,316, Cl. 29-156.80R.
Sugiura, Masashi: *See—*
Isobe, Masahiro; and Sugiura, Masashi, 4,571,221, Cl. 474-101.000.
Suh, Nam P.; and Burgess, Steven M., to Massachusetts Institute of Technology. Materials for use in tribological applications. 4,571,358, Cl. 428-155.000.
Sullivan, Jack M.: *See—*
Radel, Robert J.; and Sullivan, Jack M., 4,571,435, Cl. 564-135.000.
Sullivan, Timothy A.; and Morgan, Gregory L., to Owens-Corning Fiberglas Corporation. Apparatus for producing glass fibers. 4,571,251, Cl. 65-12.000.
Sulzer Brothers Limited: *See—*
Bachmann, Urs, 4,570,682, Cl. 139-1.00C.
Griffith, John D., 4,570,683, Cl. 139-194.000.
Sumitomo Bakelite Company Limited: *See—*
Suzuki, Setsuo; Morishita, Koji; and Sakamoto, Yushi, 4,571,314, Cl. 264-1.700.
Sumitomo Cement Co., Ltd.: *See—*
Matsui, Ichiro; Kobayashi, Hiroaki; and Sano, Hideo, 4,571,124, Cl. 405-239.000.
Sumitomo Chemical Company, Limited: *See—*
Umemura, Takeaki; Inoue, Ayumu; and Mitsuda, Satoshi, 4,571,436, Cl. 568-354.000.
Sumitomo Electric Industries, Ltd.: *See—*
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, 4,571,357, Cl. 428-153.000.
Ono, Kimizo, 4,571,023, Cl. 350-96.250.
Sumitomo Metal Industries, Ltd.: *See—*
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.
Sumitomo Rubber Industries, Ltd.: *See—*
Yamada, Mikio, 4,570,937, Cl. 273-220.000.
Sump, Kenneth R., to Battelle Development Corporation. Porous coatings from wire mesh for bone implants. 4,570,271, Cl. 623-18.000.
Sunbeam Plastics Corporation: *See—*
Hawkins, Gene, 4,570,810, Cl. 215-253.000.
Sunday, Brooks R.; and Witkowski, Joseph T., to Schering Corporation. Anti-bronchoconstriction 2-(4'-pyridinyl)-thiazole derivatives, composition, and method of use therefor. 4,571,402, Cl. 514-336.000.
Sundstrand Corporation: *See—*
Kintz, Lawrence J., Jr.; and Blain, Edward S., 4,571,518, Cl. 310-68.00R.
Sunkle, Thomas H.: *See—*
Higginbotham, James M., Jr.; Varasso, Eugene C.; Rapp, Kenneth L.; and Sunkle, Thomas H., 4,571,587, Cl. 340-825.530.
Sunol Systems Incorporated: *See—*
McCullough, Robert B., 4,571,575, Cl. 340-347.0DD.
Superior Handling Equipment, Inc.: *See—*
Moseley, John F.; and Austin, Stephen R., 4,571,139, Cl. 414-347.000.
Superior Walls: *See—*
Zimmerman, Melvin M., 4,570,398, Cl. 52-169.110.
Suto, Ken: *See—*
Nishizawa, Jun-ichi; and Suto, Ken, 4,571,727, Cl. 372-4.000.
Sutton Engineering Company: *See—*
Huertgen, Helmut B., 4,570,473, Cl. 72-255.000.
Suvorova, Ljudmila I.: *See—*
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Suzuki, Hideo: *See—*
Iwashita, Takashi; Suzuki, Hideo; and Nakahama, Ryoji, 4,570,776, Cl. 192-114.00R.
Suzuki, Hitoshi: *See—*
Watanabe, Yoshimi; Tada, Yukio; Suzuki, Takanori; and Suzuki, Hitoshi, 4,570,587, Cl. 123-193.00P.
Suzuki, Katsuhiko: *See—*
Ohta, Kazutoshi; and Suzuki, Katsuhiko, 4,570,753, Cl. 187-1.00R.
Suzuki, Koichi: *See—*
Kaneko, Kenichi; Hirashiba, Yuji; Kawai, Shinji; and Suzuki, Koichi, 4,570,274, Cl. 4-443.000.

Suzuki, Koji; and Tano, Eiichi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focus detecting camera. 4,571,046, Cl. 354-400.000.

Suzuki, Koji: *See*—
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, 4,571,725, Cl. 371-25.000.

Suzuki, Nichiro: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.

Suzuki, Setsuo; Morishita, Koji; and Sakamoto, Yushi, to Sumitomo Bakelite Company Limited. Process for producing substrate for optical recording medium. 4,571,314, Cl. 264-1.700.

Suzuki, Shigeo, to Nippon Gakki Seizo Kabushiki Kaisha. Adjustable bottom closure for a resonator on sound bar type percussive musical instruments. 4,570,525, Cl. 84-410.000.

Suzuki, Takanori: *See*—
Watanabe, Yoshimi; Tada, Yukio; Suzuki, Takanori; and Suzuki, Hitoshi, 4,570,587, Cl. 123-193.00P.

Suzuki, Toshiyuki; and Isshiki, Masanori, to Tokyo Shibaura Denki Kabushiki Kaisha. Perpendicular magnetic recording head. 4,571,653, Cl. 360-125.000.

Suzuki, Yoshio, to Sony Corporation. Liquid crystal image display system. 4,571,584, Cl. 340-784.000.

Svard, Bengt: *See*—
Pollack, Zoltan; and Svard, Bengt, 4,571,472, Cl. 219-9.500.

Svensson, Lars T. E.: *See*—
Carlqvist, Bengt R.; and Svensson, Lars T. E., 4,571,719, Cl. 370-32.000.

Swallow, Nancy A.: *See*—
Lehmann, Douglas M.; Kunz, Gordon F.; Kirkpatrick, Paul A.; Swallow, Nancy A.; Leshik, Richard R.; and Schulman, Marvin, 4,571,346, Cl. 426-576.000.

Swasey, Archie N.; and Winter, William J., to USM Corporation. Self-adjusting minimum clearance bearing. 4,571,096, Cl. 384-266.000.

Swedlow, Inc.: *See*—
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., 4,571,365, Cl. 428-412.000.

Sweeney, James S., Jr., to Unisen, Inc. Adaptive pulsing motor control for positioning system. 4,571,530, Cl. 318-594.000.

Swessel, Michael A.: *See*—
Hahn, Norbert; and Swessel, Michael A., 4,570,277, Cl. 14-71.300.

Swingline, Inc.: *See*—
Olesen, Paul, 4,570,841, Cl. 227-95.000.

Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Liquid mixing system. 4,571,092, Cl. 366-348.000.

Sybron Corporation: *See*—
Hamilton, James C., 4,571,188, Cl. 433-226.000.

Symes, Ken C.; Langley, John; and Flesher, Peter, to Allied Colloids Limited'. Polymer suspensions. 4,571,422, Cl. 536-114.000.

Syntex (U.S.A.) Inc.: *See*—
Hsiao, Charles H.; and Kent, John S., 4,571,333, Cl. 424-22.000.
Nash, John E., 4,571,183, Cl. 433-116.000.

Sytwu, James: *See*—
Lusignan, Bruce B.; Sytwu, James; and Badawi, Amr, 4,571,723, Cl. 370-110.200.

Szabo, Rene : *See*—
Genini, Maurice; and Szabo, Rene , 4,570,716, Cl. 166-346.000.

Szanto, Elmer G.; Davio, Franklin J.; and Wallace, Lloyd V., to Velo-Bind, Inc. Book core gauge and positioning guide for casing book cores. 4,570,351, Cl. 33-180.00R.

Szemere, Robert; Majoros, Jozsef; and Cseve, Ferenc, to Magyar Optikai Muvek. Ampoule opener. 4,570,838, Cl. 225-93.000.

Szerlip, Stanley R., to Discovision Associates. Method and apparatus for scanning a recording medium for defects. 4,571,716, Cl. 369-54.000.

T.A.D. Avanti, Inc.: *See*—
Bond, Raymond G., 4,571,458, Cl. 179-6.110.

Tabel- und Metallwerke Gutehoffnungshuette: *See*—
Ratti, Satya P., 4,570,680, Cl. 138-149.000.

Tabuchi, Hiroshi: *See*—
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,571,125, Cl. 405-224.000.

Tackett, Edd; and Broscoff, Mary E. Glazing tool. 4,571,170, Cl. 425-458.000.

Tada, Yukio: *See*—
Watanabe, Yoshimi; Tada, Yukio; Suzuki, Takanori; and Suzuki, Hitoshi, 4,570,587, Cl. 123-193.00P.

Tadauchi, Masaharu; Sato, Kunio; Tanno, Kiyohiko; Suehiro, Hiroshi; and Inoue, Yasuo, to Hitachi, Ltd. Apparatus for converting an analog signal to a binary signal. 4,571,573, Cl. 340-347.0AD.

Tadini, Giorgio: *See*—
Caneschi, Mario; and Tadini, Giorgio, 4,571,634, Cl. 358-261.000.

Tahara, Kouichi: *See*—
Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, 4,571,274, Cl. 148-156.000.

Taig, Alistair G., to Allied Corporation. Power assist device for a vehicle steering system. 4,570,734, Cl. 180-79.100.

Takada, Haruhiko: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,571,164, Cl. 418-76.000.

Takada, Saburo. Corner cover for use in binding. 4,571,107, Cl. 402-14.000.

Takada, Yukimitsu; and Karada, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor. 4,571,193, Cl. 440-77.000.

Takagi, Shigeki; and Urayama, Yumiko, to Kabushiki Kaisha Kyoritsu Yuki Kogyo Kenkyusho. Nitrogen fertilizer manifesting fungicidal property against pathogenic fungi. 4,571,256, Cl. 71-28.000.

Takahashi, Masanobu: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.

Takahashi, Shinji: *See*—
Kawarabashi, Tsukasa; and Takahashi, Shinji, 4,570,865, Cl. 242-35.50A.

Takahashi, Toshiyuki: *See*—
Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, 4,571,006, Cl. 303-6.00C.

Takamizawa, Minoru: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.

Takanabe, Kazunori; Yamamoto, Masaki; Ito, Kenzo; and Fujinami, Hiroshi, to Nippondenso Co., Ltd. Map display system for vehicles. 4,571,684, Cl. 364-449.000.

Takano, Hiroshi, to Mitsuboshi Belting Ltd. Variable pulley structure. 4,571,217, Cl. 474-46.000.

Takaoka, Michio; Mohtai, Tsuneaki; Yoshida, Syotaroh; and Watanabe, Kazuo, to Fujikura Cable Works, Limited, The. Conductor for an electrical power cable. 4,571,453, Cl. 174-110.00A.

Takara Co., Ltd.: *See*—
Matsuda, Takashi, 4,571,201, Cl. 446-85.000.

Takashima, Satoshi: *See*—
Akanuma, Shigetake; Takashima, Satoshi; Imamura, Haruo; and Ojiro, Yoshitaka, 4,571,002, Cl. 299-22.000.

Takayama, Hidehiko: *See*—
Shibuya, Tsunenori; Ishizuka, Yutaka; Takada, Haruhiko; Nakamura, Teruo; and Takayama, Hidehiko, 4,571,164, Cl. 418-76.000.

Takayama, Makoto: *See*—
Fujiki, Makoto; and Takayama, Makoto, 4,571,641, Cl. 360-19.100.

Takayama, Masaharu; Taniguchi, Seiichi; Enomoto, Masayasu; and Muramoto, Masahiro, to Nippon Shoji Kaisha, Ltd. Reagent for measuring direct bilirubin by enzymatic method and method for measurement thereof. 4,571,383, Cl. 435-25.000.

Takayanagi, Yoshiaki: *See*—
Nagashima, Nao; Kuroda, Kouki; Nagahira, Jyoji; Takayanagi, Yoshiaki; and Suzuki, Koji, 4,571,725, Cl. 371-25.000.

Take, Tokio; Sonoda, Satoshi; and Yamamoto, Takayuki, to Kioritz Corporation. Throttle safety device. 4,570,593, Cl. 123-398.000.

Takeda Chemical Industries, Ltd.: *See*—
Minamida, Hisatsugu; Kato, Akira; Sawayama, Isamu; and Tanaka, Ken-ichi, 4,571,412, Cl. 524-64.000.
Nomura, Hiroaki; and Akimoto, Hiroshi, 4,571,423, Cl. 544-280.000.

Takeda, Fumio: *See*—
Kawabata, Akira; Shiosaki, Tadashi; Takeda, Fumio; Fujishima, Satoru; and Ieki, Hideharu, 4,571,519, Cl. 310-313.00A.

Takeda, Shuji, to TANAC Engineering Kabushiki Kaisha. Tensioning device for coil winding machine. 4,570,874, Cl. 242-147.00R.

Takeda, Yukio: *See*—
Matsushita, Yasuo; Takeda, Yukio; Nakamura, Kousuke; and Ohkoshi, Tokio, 4,571,610, Cl. 357-67.000.

Takemi, Akio; Yoshimi, Akiro; and Kawai, Takayoshi, to Nippondenso Co., Ltd. Apparatus for controlling automotive air conditioners. 4,570,450, Cl. 62-199.000.

Takenouchi, Masanori: *See*—
Urawa, Motoo; Takenouchi, Masanori; Kan, Fumitaka; Suematsu, Kohshi; and Imai, Eiichi, 4,571,372, Cl. 430-122.000.

Takeo, Seiji; and Amari, Akira, to NEC Corporation. Printer. 4,571,103, Cl. 400-616.200.

Taki, Masakazu: *See*—
Maeda, Susumu; Taki, Masakazu; and Yoshizawa, Kenji, 4,571,479, Cl. 219-124.340.

Takise, Tadashi, to Sony Corporation. Microphone apparatus. 4,570,742, Cl. 181-175.000.

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Kawaguchi, Hideo; Okita, Tsutomu; and Tamaki, Hiroyuki, 4,571,361, Cl. 428-328.000.

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Nishizawa, Junichi; Tamamushi, Takashige; Shimanuki, Koji; and Inuiya, Masafumi, 4,571,624, Cl. 358-212.000.

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Tammen, James F.: *See*—
Oglevee, James R.; Tammen, James F.; and O'Donovan, Wendy O., 4,570,379, Cl. 47-58.000.

Tamura, Kaoru: *See*—
Yamada, Sadami; and Tamura, Kaoru, 4,571,140, Cl. 414-412.000.
Tamura, Takashi: *See*—
Horiuchi, Tatsumi; Tamura, Takashi; and Kusuda, Tatufumi, 4,571,063, Cl. 355-8.000.
Tamura, Teizo: *See*—
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.
Tanabe, Yoshio: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.
TANAC Engineering Kabushiki Kaisha: *See*—
Takeda, Shuji, 4,570,874, Cl. 242-147.00R.
Tanaka, Hiroshi; Mitani, Sotozi; and Sakurai, Yasushi, to Nissan Motor Co., Ltd. Apparatus for bending metal plate in widthwise direction. 4,570,474, Cl. 72-411.000.
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Tanaka, Ken-ichi: *See*—
Minamida, Hisatsugu; Kato, Akira; Sawayama, Isamu; and Tanaka, Ken-ichi, 4,571,412, Cl. 524-64.000.
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Kishi, Hajimu; and Tanaka, Kunio, 4,571,670, Cl. 364-171.000.
Tanaka, Shinsaku; and Arata, Tadao, to Tanashin Denki Co., Ltd. Tape recorder. 4,571,647, Cl. 360-105.000.
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Tanashin Denki Co., Ltd.: *See*—
Tanaka, Shinsaku; and Arata, Tadao, 4,571,647, Cl. 360-105.000.
Tandem Computers Incorporated: *See*—
Horst, Robert W.; and Harris, Richard L., 4,571,673, Cl. 364-200.000.
Tani, Tatsuo; and Kawaishi, Yasunori, to Ricoh Company, Ltd. Fixing device. 4,571,056, Cl. 355-3.0FU.
Taniguchi, Masakazu; Baba, Masatoshi; Ochiai, Yoshinori; Hirose, Masayoshi; and Hirata, Kiminori, to Nissan Chemical Industries. Pyridazinone derivatives, preparation thereof, and agricultural and horticultural fungicidal, insecticidal, acaricidal, nematicidal compositions containing said derivatives. 4,571,397, Cl. 514-252.000.
Taniguchi, Seiichi: *See*—
Takayama, Masaharu; Taniguchi, Seiichi; Enomoto, Masayasu; and Muramoto, Masahiro, 4,571,383, Cl. 435-25.000.
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; and Fuzikawa, Kazuhiko, to Shin Nisso Kako Co., Ltd. Process for preparing alkoxyphosphonitrile compounds. 4,571,310, Cl. 260-973.000.
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Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.
Tanizaki, Hiroyuki; Sato, Kazuma; Munakata, Kiyohiko; and Kanazawa, Yuzo, to Nissan Motor Co., Ltd. Sliding lock mechanism for rotary seat assembly. 4,570,997, Cl. 297-349.000.
Tanner, Hans; and Fischer, Kurt, to Georg Fischer Aktiengeselleschaft. Apparatus for the compression of granular material. 4,571,168, Cl. 425-405.00R.
Tanno, Kiyohiko: *See*—
Tadauchi, Masaharu; Sato, Kunio; Tanno, Kiyohiko; Suehiro, Hiroshi; and Inoue, Yasuo, 4,571,573, Cl. 340-347.0AD.
Tano, Eiichi: *See*—
Suzuki, Koji; and Tano, Eiichi, 4,571,046, Cl. 354-400.000.
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, to Hitachi Zosen Corporation. Apparatus for abrasive cleaning. 4,570,388, Cl. 51-177.000.
Tarasenko, Vladimir I.: *See*—
Kostyiev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.
Tarumi, Noriyoshi; Fukuchi, Masakazu; and Ito, Kunio, to Konishiroku Photo Industry Co., Ltd. Toner supply controlling device. 4,571,068, Cl. 355-14.00D.
Tatar, Frank J. Vertical axis windmill. 4,571,152, Cl. 415-4.000.
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, to Taurus Gumiipari Vallalat. Elastic self carrying bellows. 4,570,964, Cl. 280-403.000.
Tateoka, Masamichi: *See*—
Minoura, Kazuo; and Tateoka, Masamichi, 4,571,021, Cl. 350-6.800.
Taupin, Pierre; Goguillon, Claude; and de Moncuit, Frederic, to Boussois S.A. Method and apparatus for determining the coordinates of a point on a surface. 4,571,577, Cl. 340-347.00R.
Taurus Gumiipari Vallalat: *See*—
Tatay, Ilona; Gundisch, Gusztav; Madi, Jeno; Palotas, Laszlo ; and Subotics, Gyula, 4,570,964, Cl. 280-403.000.
Taylor, Christopher J. C.: *See*—
Wiggs, Christopher C.; and Taylor, Christopher J. C., 4,570,868, Cl. 242-55.530.
Taylor, Julian S. Vacuum tube engine oil sampler. 4,570,685, Cl. 141-61.000.
Taylor, Larry W., to Magic Pantry Foods Inc. Kitchen utensil for food retort pouches. 4,570,339, Cl. 30-2.000.
Taylor, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P. Method of inhibiting herpetic lesions by the use of platinum coordination compounds. 4,571,335, Cl. 424-131.000.
Taylor, Robert E., to Nartron Corporation. Condition monitoring means. 4,571,537, Cl. 323-326.000.
TDK Electronics Co., Ltd.: *See*—
Sato, Nobuhiro; Okada, Akira; and Nakashima, Yutaka, 4,571,362, Cl. 428-329.000.
Technigaz: *See*—
Morand, Pierre, 4,570,815, Cl. 220-75.000.
Tecnol, Inc.: *See*—
Hubbard, Vance M.; and Brunson, Welton K., 4,571,245, Cl. 604-179.000.
Teijin Limited: *See*—
Yoshida, Tsunemasa; Wakabayashi, Toshio; and Matsumoto, Keizo, 4,571,334, Cl. 424-95.000.
Teknico Industries, Inc.: *See*—
Rice, G. Kenneth, 4,570,713, Cl. 166-275.000.
Rice, G. Kenneth, 4,571,328, Cl. 423-69.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Chevreau, Jean-Philippe J.; and Guidoux, Loic B. Y., 4,571,720, Cl. 370-32.000.
Telefonaktiebolaget L M Ericsson: *See*—
Carlqvist, Bengt R.; and Svensson, Lars T. E., 4,571,719, Cl. 370-32.000.
Legerius, Bengt E.; and Siebert, Hans W., 4,570,323, Cl. 29-451.000.
Segero, Tommy S., 4,571,464, Cl. 179-111.00E.
Telefonaktiebolaget LM Ericsson: *See*—
Nilsson, Sten V., 4,571,666, Cl. 363-15.000.
Telschow, Jeffrey E., to Stauffer Chemical Company. Preparation of cinnamic acid. 4,571,432, Cl. 562-495.000.
Teng, Lina C., to A. H. Robins Company, Incorporated. 3-Phenoxy-1-azetidinecarboxamides. 4,571,393, Cl. 514-210.000.
Tenneco Oil Company: *See*—
Keyworth, Donald A., 4,571,439, Cl. 568-697.000.
Tennessee Valley Authority: *See*—
Radel, Robert J.; and Sullivan, Jack M., 4,571,435, Cl. 564-135.000.
Tentler, Michael L.: *See*—
Davidov, Mircho A.; and Tentler, Michael L., 4,571,622, Cl. 358-194.100.
Terada, Kunio, to Horiba, Ltd. Apparatus for drawing liquid samples into a liquid testing machine. 4,570,495, Cl. 73-864.250.
Terauchi, Kiyoshi: *See*—
Sakamoto, Seiichi; and Terauchi, Kiyoshi, 4,571,163, Cl. 418-55.000.
Terskov, Alexei D.: *See*—
Kostylev, Alexandr D.; Karavaev, Andron T.; Plavskikh, Vladimir D.; Terskov, Alexei D.; Chepurnoi, Nikolai P.; Reznikov, Igor I.; and Tarasenko, Vladimir I., 4,570,723, Cl. 173-116.000.
Teshima, Shoichi, to NEC Corporation. Ink jet printer having an eccentric head guide shaft for cleaning and sealing nozzle surface. 4,571,601, Cl. 346-140.00R.
Tetra Pak International AB: *See*—
Lindsjo, Ulf J. M., 4,570,788, Cl. 229-17.00R.
Texaco Inc.: *See*—
Chandra, Tapan K.; and Major, Jonathan C., 4,571,123, Cl. 405-212.000.
Kokolis, George P., 4,570,712, Cl. 166-273.000.
Texas Instruments Incorporated: *See*—
Hornbeck, Larry J.; Nelson, William E.; and Carlo, James T., 4,571,603, Cl. 346-160.000.
Klinkovsky, Edward R.; and Severin, William A., 4,571,731, Cl. 375-9.000.
Stambaugh, Mark A.; Sacarisen, Stephen P.; and Patrick, Michael W., 4,571,675, Cl. 364-200.000.
Texfi Industries, Inc.: *See*—
Thompson, Jack E., 4,570,464, Cl. 68-178.000.
Theobald, Michael R., to Caterpillar Tractor Co. Countershaft transmission. 4,570,503, Cl. 74-360.000.
Thermal Concepts, Inc.: *See*—
Bingham, Grady A., 4,570,452, Cl. 62-260.000.
Thetford Corporation: *See*—
Antos, John M.; and Selina, John, 4,570,273, Cl. 4-321.000.
Thevenin, Jean-Claude: *See*—
Allemand, Louis R.; Calvet, Jean; Cavan, Jean-Claude; Goldwasser, Maurice; and Thevenin, Jean-Claude, 4,571,313, Cl. 264-1.500.
Thevenon, Alain, to Instruments S.A. Spectrometry device for analyzing polychromatic light. 4,571,074, Cl. 356-51.000.
Thierheimer, Charles L., Jr.: *See*—
Matlach, William J.; Newberry, Michael E.; and Thierheimer, Charles L., Jr., 4,570,656, Cl. 137-13.000.
Thoma, Wilhelm; Pisaric, Karl H.; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Leveller-containing high-solids polyurethane reactive coating systems and their use for reactive coating. 4,571,417, Cl. 525-63.000.
Thomas, Ian M.; and Tillman, James J., to Owens-Illinois, Inc. Process for forming a doped oxide film and doped semiconductor. 4,571,366, Cl. 428-446.000.
Thompson, Callie R., to Bell & Howell Company. Document conveying method and apparatus. 4,570,916, Cl. 270-52.500.
Thompson, Jack E., to Texfi Industries, Inc. Jet dyeing apparatus. 4,570,464, Cl. 68-178.000.

Thompson, Martin L. Wrench with nut-retaining mechanism. 4,570,513, Cl. 81-125.000.
Thompson, Randy E.: *See*—
Leitch, Paul A.; Chang, Robert C.; and Thompson, Randy E., 4,570,389, Cl. 51-325.000.
Thomson-CSF: *See*—
Castera, Jean-Paul, 4,571,562, Cl. 333-186.000.
Gerlach, Pierre; and Grolleau, Claude, 4,571,525, Cl. 315-39.000.
Henry, Raymond; Heitzmann, Michel; and Bouvet, Jean V., 4,571,559, Cl. 333-17.00L.
Mourier, Georges, 4,571,524, Cl. 315-4.000.
Papuchon, Michel; Arditty, Herve ; Graindorge, Philippe; and Huignard, Jean-Pierre, 4,571,080, Cl. 356-345.000.
Penato, Jean-Marie, 4,571,286, Cl. 204-15.000.
Thoone, Martinus L. G., to U.S. Philips Corporation. Device for optically scanning a document. 4,571,637, Cl. 358-293.000.
Thornton, Donald I.; and Peyton, Richard H., to Allied Corporation. Fuel system for a vehicle engine. 4,570,604, Cl. 123-514.000.
Thornton, Thirstol. Portable video viewing assembly. 4,571,628, Cl. 358-224.000.
Thwaites, John A.; Miller, Hyman; and Ferrara, Ronald A., to Contran Conveyors & Systems, Inc. Propelling and braking apparatus for a zero pressure accumulator. 4,570,780, Cl. 198-781.000.
Tiberg, Jan, to SKF Steel Engineering AB. Method of using pipes resistant to hydrosulphuric acid. 4,570,708, Cl. 166-244.100.
Tillman, James J.: *See*—
Thomas, Ian M.; and Tillman, James J., 4,571,366, Cl. 428-446.000.
Timken Company, The: *See*—
Lee, Peter W.; Kreider, Gary E.; and Widner, Ronald L., 4,571,097, Cl. 384-469.000.
Timony, Peter E.: *See*—
Leone-Bay, Andrea; and Timony, Peter E., 4,571,257, Cl. 71-92.000.
Tinsley, Charles E. Measuring and transfer system. 4,570,419, Cl. 53-473.000.
Titolo, Andrea, to Fiat Auto S.p.A. Device for regulating the axial position of a variable-profile camshaft, in particular, for controlling the timing system on an engine. 4,570,581, Cl. 123-90.180.
Toba, Shoji: *See*—
Okubo, Keigo; Toba, Shoji; and Kumagai, Tokuo, 4,571,287, Cl. 204-37.600.
Tobin, Philip J.: *See*—
Price, J. B.; Tobin, Philip J.; Pintchovski, Fabio; and Seelbach, Christian A., 4,570,328, Cl. 29-571.000.
Tobita, Nobuyuki: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Supply voltage level independent clock generator. 4,571,503, Cl. 307-269.000.
Tobita, Youichi, to Mitsubishi Denki Kabushiki Kaisha. Output circuit having decreased interference between output terminals. 4,571,509, Cl. 307-443.000.
Tochimori, Shigemitsu: *See*—
Nakano, Takao; and Tochimori, Shigemitsu, 4,571,220, Cl. 474-100.000.
Togei, Ryoiku, to Fujitsu Limited. Semiconductor device. 4,571,607, Cl. 357-23.600.
Toguchi, Akira: *See*—
Andoh, Toshihiro; Kondo, Tatsuya; and Toguchi, Akira, 4,570,876, Cl. 242-188.000.
Toide, Takasi: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.
Tokai Rubber Industries, Ltd.: *See*—
Konishi, Keizo, 4,570,911, Cl. 267-8.00R.
Tokura, Yukio: *See*—
Hayashi, Masamichi; and Tokura, Yukio, 4,571,064, Cl. 355-8.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hatano, Hiroshi, 4,571,609, Cl. 357-41.000.
Hattori, Motoichi; and Ishigo, Hideyasu, 4,571,457, Cl. 179-2.0EA.
Ishii, Takashi; Murata, Shinichi; Kusagawa, Shiro; and Wakasaki, Miyoshi, 4,570,695, Cl. 164-463.000.
Iwahashi, Hiroshi; and Ariizumi, Shoji, 4,571,706, Cl. 365-200.000.
Iwamoto, Yoshihiro; and Iida, Tetsuya, 4,571,504, Cl. 307-290.000.
Kashihara, Tomio; and Aoyagi, Katsuhiko, 4,571,688, Cl. 364-477.000.
Koga, Takashi; and Hagino, Hideyuki, 4,571,508, Cl. 307-360.000.
Kuwahara, Hisao, 4,571,536, Cl. 323-311.000.
Matsuzaki, Hikaru; and Matsuzaki, Toshiyuki, 4,570,843, Cl. 228-151.000.
Munetsugu, Eiichi, 4,571,690, Cl. 364-483.000.
Nagashima, Yoshitake, 4,571,639, Cl. 358-314.000.
Nishiki, Masayuki; and Rifu, Toshihiro, 4,571,494, Cl. 250-370.000.
Noda, Makoto, 4,571,703, Cl. 365-154.000.
Osanai, Takenori; and Oushiden, Hideshi, 4,571,061, Cl. 355-8.000.
Suzuki, Toshiyuki; and Isshiki, Masanori, 4,571,653, Cl. 360-125.000.
Watanabe, Yoshihiro, 4,571,489, Cl. 235-379.000.
Tolco, Incorporated: *See*—
Heath, Richard W., 4,570,885, Cl. 248-72.000.
Tolman, Glen L.: *See*—
Byrne, Edmund F.; and Tolman, Glen L., 4,571,430, Cl. 560-148.000.
Tomita, Satoru, to Ricoh Company, Ltd. Cleaning device for photoconductive element of electrophotographic copier or the like. 4,571,070, Cl. 355-15.000.
Tomy Company, Incorporated: *See*—
Kakizaki, Katsumi, 4,571,212, Cl. 446-462.000.
Toppan Printing Co., Ltd.: *See*—
Shinozaki, Michio; and Yoshida, Kaneki, 4,571,598, Cl. 346-76.0PH.
Toray Industries, Inc.: *See*—
Miwa, Kishio; Nagaoka, Yukiko; and Inoue, Takehisa, 4,571,441, Cl. 570-211.000.
Torisawa, Yoshio, to Kabushiki Kaisha Okuma Tekkosho. Track monitoring system for a cutter tip of a tool post in machine tools. 4,571,686, Cl. 364-474.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Date, Takao, 4,571,131, Cl. 409-209.000.
Toth, Ferenc: *See*—
Ferenczi, Gyorgy; Boda, Janos; Toth, Ferenc; Horvath, Peter; Benkovics, Laszlo ; and Dozsa, Laszlo , 4,571,541, Cl. 324-158.00D.
Tourville, David A.; and Borden, Charles D. Board game. 4,570,939, Cl. 273-253.000.
Toyko Shibaura Denki Kabushiki Kaisha: *See*—
Wada, Masashi, 4,571,705, Cl. 365-195.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Unno, Kunihiko; Tsujiuchi, Toshio; and Niino, Yasuo, 4,570,386, Cl. 51-165.710.
Unno, Kunihiko; Tsujiuchi, Toshio; and Ohta, Norio, 4,570,387, Cl. 51-165.710.
Toyoda, Yoshiharu, to Yamato Scale Company, Limited. Combination weighing system. 4,570,728, Cl. 177-25.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Hashikawa, Atsushi; Kikuchi, Tetsuro; Katoh, Kazutaka; Kuwakado, Satosi; and Kawai, Noriaki, 4,570,591, Cl. 123-331.000.
Isobe, Masahiro; and Sugiura, Masashi, 4,571,221, Cl. 474-101.000.
Kawai, Taiyo; Nakagawa, Norihisa; Kayanuma, Nobuaki; and Nagai, Toshinari, 4,570,590, Cl. 123-308.000.
Sakurai, Shigenori; Kamo, Takashi; and Ikai, Tadayoshi, 4,570,479, Cl. 73-116.000.
Sato, Kunihiko, 4,570,596, Cl. 123-421.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Nobuyuki; Isobe, Toshiaki; Ohkawa, Nobuhisa; and Kuma, Takahide, 4,571,683, Cl. 364-431.050.
Tracy, Wayne R., to Incom International Inc. Bicycle chain structure. 4,571,228, Cl. 474-231.000.
Trager, Wesley H., to Washington Innovative Technology, Inc. Flyback modulated switching power amplifier. 4,571,551, Cl. 330-10.000.
Traub, Henry A., to W. S. Shamban & Company. Seal assembly with reduced wear low pressure sealing ring. 4,570,944, Cl. 277-121.000.
Traveltec International, Inc.: *See*—
Fathi, Saul S., 4,571,483, Cl. 219-271.000.
Treiber, Fritz F.: *See*—
Stockmeier, Glenn R.; and Treiber, Fritz F., 4,570,412, Cl. 53-167.000.
Tribbett, Kenneth E., to Geo. A. Hormel & Co. Dual extrusion apparatus. 4,570,298, Cl. 17-41.000.
Triggiani, Richard R.: *See*—
Hambleton, Thomas P.; and Triggiani, Richard R., 4,570,817, Cl. 220-345.000.
Trim, Inc.: *See*—
Shoemaker, Nancy A., 4,570,929, Cl. 272-137.000.
Trinh Van, Christian: *See*—
Lods, Jean; and Trinh Van, Christian, 4,571,549, Cl. 332-16.00R.
Triolo, Ferdinand: *See*—
DiCicca, Franscesco; Fahmy, Farid M.; and Triolo, Ferdinand, 4,571,342, Cl. 426-533.000.
Triscori, Ronald J.: *See*—
Krigmont, Henry V.; Haaland, Harold H.; Triscori, Ronald J.; Spencer, Herbert W., III; and Stern, Jay L., 4,571,330, Cl. 423-242.000.
Troxell, John R., to General Motors Corporation. Reducing hydrogen content of vacuum deposited films. 4,571,348, Cl. 427-38.000.
Trozzi, Norman K. Splitter for use with a coal-fired furnace utilizing a low load burner. 4,570,549, Cl. 110-106.000.
Tru Fire Corporation: *See*—
Peck, Paul L., 4,570,606, Cl. 124-24.00R.
Trumpf GmbH & Co.: *See*—
Klingel, Hans; and Matheis, Alfred, 4,570,327, Cl. 29-568.000.
TRW Ehrenreich GmbH & Co. KG: *See*—
Amrath, Hans, 4,571,110, Cl. 403-141.000.
Tsai, Chin-Wang. Fire escape. 4,570,750, Cl. 182-44.000.
Tsai, George C.; and Benstsen, Svend J., to Armor Electric Company, Inc. Digital landing computer for elevator. 4,570,755, Cl. 187-29.00R.
Tseitlin, Moshe: *See*—
Finkelman, Steven L.; and Tseitlin, Moshe, 4,570,349, Cl. 33-143.00L.
Tsubakimoto Chain Co.: *See*—
Ishikura, Takashi; and Sakamoto, Hisakazu, 4,570,543, Cl. 104-300.000.
Tsuchiya, Kiyoshi: *See*—
Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano,

Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, 4,571,122, Cl. 405-184.000.
Tsuchiya, Takeshi; and Samejima, Shuji, to Nippon Piston Ring Co., Ltd. Nitrided piston ring with outer layer on surface. 4,570,946, Cl. 277-216.000.
Tsui, Shui K.: *See—*
Wong, Hon; and Tsui, Shui K., 4,570,987, Cl. 294-1.100.
Tsuji, Nobuo: *See—*
Kasuga, Akira; Matsufuji, Akihiro; Yamada, Yasuyuki; and Tsuji, Nobuo, 4,571,364, Cl. 428-336.000.
Tsuji, Shintaro, to Sanrio Company, Ltd. Spool for ribbons, tapes, etc. 4,570,869, Cl. 242-71.900.
Tsujii, Gen; and Yanagisawa, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Transformer with rectifier. 4,571,669, Cl. 363-144.000.
Tsujimura, Harutoshi; and Kamijo, Ken, to Nissan Motor Co., Ltd. Seat belt retractor. 4,570,872, Cl. 242-107.000.
Tsujiuchi, Toshio: *See—*
Unno, Kunihiko; Tsujiuchi, Toshio; and Niino, Yasuo, 4,570,386, Cl. 51-165.710.
Unno, Kunihiko; Tsujiuchi, Toshio; and Ohta, Norio, 4,570,387, Cl. 51-165.710.
Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, to Olympus Optical Co., Ltd. Photographic camera of multiple spot photometry type. 4,571,049, Cl. 354-410.000.
Tsutsui, Eiji: *See—*
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.
Tsutsumi, Takashi; and Matsumoto, Shuji, to Nissan Motor Company, Limited. Torsion bar suspension for an automotive vehicle. 4,570,969, Cl. 280-664.000.
Tuggle, Bonnie E.: *See—*
Schell, James E., deceased; Lucas, Stephen G.; Neff, Dale A.; and Tuggle, Bonnie E., 4,571,291, Cl. 204-213.000.
Tuneke, Wilhelm; and Weber, Jurgen, to Duropal-Werk Ebehr. Wrede GmbH & Co. KG. Composite plate and method of making same. 4,570,410, Cl. 52-811.000.
Turnage, William E., to Philip Morris Incorporated. Folding carton and blank therefor, for cigarettes. 4,570,790, Cl. 206-263.000.
Turner, Dewayne; Menard, Raymond A.; and Oneal, Dean, to Geo Vann, Inc. Gravel pack assembly. 4,570,714, Cl. 166-278.000.
Tyler, Derek E.: *See—*
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,570,699, Cl. 164-503.000.
Yarwood, John C.; and Tyler, Derek E., 4,570,696, Cl. 164-467.000.
Uchinishi, Eizaburo, to Kawasaki Jukogyo Kabushiki Kaisha. Exhaust control system for 2-cycle engines. 4,570,439, Cl. 60-314.000.
Uebel, Philipp; Rousek, Jaroslav; and Uhlig, Raimer, to Hilti Aktiengesellschaft. Device for adjustably mounting facing plates. 4,570,401, Cl. 52-235.000.
Ueda, Hiroshi: *See—*
Kobayashi, Haruo; and Ueda, Hiroshi, 4,571,043, Cl. 354-121.000.
Ueda, Kenji, to Kabushiki Kaisha Ishida Koki Seisakusho. Collection chute for automatic weighing apparatus. 4,570,727, Cl. 177-25.000.
Ueda, Minoru: *See—*
Iyehara, Sadahiro; Inohara, Shizuo; Masuda, Mitsuya; Ueda, Minoru; and Yamamoto, Keisuke, 4,571,614, Cl. 358-56.000.
Uekita, Masakazu: *See—*
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.
Uematsu, Kimio, to Nippon Kagaku K.K. Light-intercepting blade for a light control device. 4,571,045, Cl. 354-245.000.
Ueno, Hideo; and Kurokawa, Yuji, to Brother Kogyo Kabushiki Kaisha. Electronic typewriter. 4,571,100, Cl. 400-17.000.
Ueno, Iwao: *See—*
Mukai, Yoshiaki; and Ueno, Iwao, 4,570,968, Cl. 280-664.000.
Ueno, Tsutomu: *See—*
Hiroki, Nobuyoshi; Ikemiya, Hiroyuki; Michioka, Ryo; Ueno, Tsutomu; Kishimoto, Yasuo; and Nagano, Yosisuke, 4,570,909, Cl. 266-281.000.
Ueno, Yasushi: *See—*
Kamio, Hiroshi; Ueno, Yasushi; Noguchi, Takao; Kunioka, Kazuo; and Fukuda, Shuzo, 4,570,453, Cl. 62-375.000.
Uetsuji, Yonekazu; and Watanabe, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. General-purpose internal combustion engine with vertical crank shaft. 4,570,584, Cl. 123-179.0SE.
Ueyama, Shinichiro: *See—*
Tanino, Hiroshi; Okamoto, Tetsuhiko; Ueyama, Shinichiro; and Fuzikawa, Kazuhiko, 4,571,310, Cl. 260-973.000.
Uhlig, Raimer: *See—*
Uebel, Philipp; Rousek, Jaroslav; and Uhlig, Raimer, 4,570,401, Cl. 52-235.000.
Ukai, Yujiro: *See—*
Ishibashi, Kiyoshi; Ukai, Yujiro; Mita, Hideo; and Shiroshita, Yoshihira, 4,570,445, Cl. 62-6.000.
Ukita, Hiroo: *See—*
Kato, Kikuji; Watabe, Akinori; Ukita, Hiroo; and Yonezawa, Susumu, 4,571,715, Cl. 369-45.000.
Ultra Lift Corporation: *See—*
McPeak, Ercel W.; Felzer, Theodore; and Rodgers, Frederick J., 4,570,953, Cl. 280-5.300.
Umemura, Takeaki; Inoue, Ayumu; and Mitsuda, Satoshi, to Sumitomo Chemical Company, Limited. Process for producing optically active cyclopentenolones. 4,571,436, Cl. 568-354.000.
Unagami, Shigeyuki: *See—*
Kaku, Takashi; Unagami, Shigeyuki; and Inoue, Masayoshi, 4,571,733, Cl. 375-13.000.
Ungerboeck, Gottfried: *See—*
Dolivo, Francois B.; Ungerboeck, Gottfried; and Howell, Thomas D., 4,571,734, Cl. 375-18.000.
Uni-Cardan Aktiengesellschaft: *See—*
Balken, Jochen; Krude, Werner; and Orain, Michel A., 4,571,099, Cl. 384-513.000.
Union Camp Corporation: *See—*
Batelka, Joseph J., 4,570,546, Cl. 108-51.100.
Union Carbide Corporation: *See—*
Beckman, John H.; and Nausedas, Joseph A., 4,570,301, Cl. 17-49.000.
Brown, Russell L.; Bryant, George M.; and Cunningham, Charles J., 4,571,360, Cl. 428-318.400.
Forte, Paulino, 4,571,295, Cl. 208-334.000.
Keen, Brian T.; and Robson, John H., 4,571,440, Cl. 568-872.000.
Maresca, Louis M., 4,571,419, Cl. 525-177.000.
Nausedas, Joseph A., 4,570,300, Cl. 17-49.000.
Wallace, Rodney L., 4,570,292, Cl. 17-1.00R.
Unisen, Inc.: *See—*
Sweeney, James S., Jr., 4,571,530, Cl. 318-594.000.
United States Gypsum Company: *See—*
Slager, Richard E.; and Balinski, Henry A., 4,570,400, Cl. 52-235.000.
Wendt, Alan C., 4,570,390, Cl. 52-36.000.
United States of America
Air Force: *See—*
Haupt, Randy L., 4,571,594, Cl. 343-840.000.
Hildebrand, James R.; and Sobanski, Kurt J., 4,571,689, Cl. 364-481.000.
Husbands, Charles R., 4,571,024, Cl. 350-96.190.
Karas, Nicholas V., 4,571,578, Cl. 340-541.000.
Army: *See—*
Grinwald, Israel M., 4,570,959, Cl. 280-43.230.
Hunter, Joe S.; and Little, Lawrence J., 4,570,507, Cl. 74-5.120.
Schaphorst, Richard A.; and Bodson, Charles D., 4,571,632, Cl. 358-260.000.
Skeldon, Mark D., 4,571,077, Cl. 356-239.000.
Wortman, Donald E.; and Leavitt, Richard P., 4,571,726, Cl. 372-2.000.
Energy: *See—*
Dunn, Patrick F.; Herceg, Joseph E.; and Klocksieben, Robert H., 4,570,494, Cl. 73-863.220.
Reimann, Robert C.; and Root, Richard A., 4,570,456, Cl. 62-476.000.
Ringsmuth, Richard J.; and Kaufman, Jay S., 4,570,703, Cl. 165-162.000.
Skotheim, Terje A.; O'Grady, William E.; and Linkous, Clovis A., 4,571,029, Cl. 350-357.000.
Health and Human Services: *See—*
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.
Navy: *See—*
Breglia, Denis R.; and Patz, Benjamin W., 4,571,631, Cl. 358-231.000.
Dean, Charles F.; Lauer, Edward W.; and Riggs, David L., 4,570,658, Cl. 137-68.200.
Russell, William R.; and Russell, Samuel G., executor, 4,571,679, Cl. 364-300.000.
Valentino, Pasquale A.; Stangel, John J.; and Donelin, Dwayne D., 4,571,591, Cl. 343-754.000.
U.S. Philips Corporation: *See—*
Boudewijns, Arnoldus J. J., 4,571,625, Cl. 358-213.000.
de Vries, Jan; and de Ruiter, Jacob W., 4,571,522, Cl. 313-485.000.
Haisma, Jan; and Bouwhuis, Gijsbertus, 4,571,616, Cl. 358-88.000.
Janssen, Daniel J. G., 4,571,462, Cl. 179-84.00T.
Schiebel, Ulrich, 4,571,604, Cl. 346-161.000.
Thoone, Martinus L. G., 4,571,637, Cl. 358-293.000.
Wesselink, Gustaaf A., 4,571,526, Cl. 315-56.000.
U.S. Product Development Company: *See—*
Adell, Robert, 4,570,383, Cl. 49-462.000.
United Technologies Corporation: *See—*
Gudlauski, Edward B.; and Wagner, Thomas R., 4,571,089, Cl. 366-139.000.
Kish, Jules G., 4,570,318, Cl. 29-173.000.
Layden, George K., Jr.; Bourdeau, Romeo G.; and Pike, Roscoe A., 4,571,317, Cl. 264-29.100.
Unitta Co., Ltd.: *See—*
Arinaga, Kuniomi, 4,571,224, Cl. 474-153.000.
Universal Building Systems, Inc.: *See—*
Johnson, Bernard L., 4,570,402, Cl. 52-241.000.
Universal Symetrics Corporation: *See—*
Mednis, Juris M., 4,570,799, Cl. 206-509.000.
University of California, The Regents of the: *See—*
Lieber, Richard L.; and Baskin, Ronald J., 4,570,641, Cl. 128-774.000.
Soong, David S., 4,570,478, Cl. 73-60.000.
University of Dayton, The: *See—*
Smith, Steven R.; and Solomon, James S., 4,570,324, Cl. 29-576.00B.
University of Delaware: *See—*
Barnett, Allen M., 4,571,448, Cl. 136-259.000.

University of Illinois Foundation: *See*—
Widra, Abe, 4,570,629, Cl. 128-156.000.
University of Minnesota, Regents of the: *See*—
Fletcher, Edward A., 4,570,589, Cl. 123-193.00P.
University of Southwestern Louisiana: *See*—
Agrawal, Jagannath P.; and Iyer, Subramaniam S., 4,571,736, Cl. 375-27.000.
University of Texas System: *See*—
Weldon, William F., 4,571,468, Cl. 200-61.080.
University of Texas System Board of Regents, The: *See*—
Abell, Creed W.; and Denney, Richard M., 4,571,381, Cl. 435-7.000.
University of Waterloo: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., 4,571,094, Cl. 374-29.000.
Unno, Kunihiko; Tsujiuchi, Toshio; and Niino, Yasuo, to Toyoda Koki Kabushiki Kaisha. Regulating wheel dressing system in centerless grinder. 4,570,386, Cl. 51-165.710.
Unno, Kunihiko; Tsujiuchi, Toshio; and Ohta, Norio, to Toyoda Koki Kabushiki Kaisha. Centerless grinding machine. 4,570,387, Cl. 51-165.710.
Uno, Kinichi; and Nakahara, Tohru, to NEC Corporation. Conference telephone apparatus. 4,571,461, Cl. 179-81.00B.
Uozumi, Shoji: *See*—
Oizumi, Masayuki; Uekita, Masakazu; Goto, Masana; Azumi, Ichiro; Uozumi, Shoji; Abe, Masaharu; Fushiki, Yasuo; Isshiki, Minoru; and Kawasaki, Kunio, 4,571,279, Cl. 156-270.000.
Urasato, Nobuaki: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; Kobayashi, Taishi; Hayashida, Akira; Urasato, Nobuaki; Ohsaki, Hiromi; Suzuki, Nichiro; and Toide, Takasi, 4,571,331, Cl. 423-345.000.
Urata, Norio: *See*—
Tano, Hiroshi; Takahashi, Masanobu; Shiraishi, Minoru; Numata, Yoshimi; Urata, Norio; Kawano, Tatsuo; and Onaka, Tatsumi, 4,570,388, Cl. 51-177.000.
Urawa, Motoo; Takenouchi, Masanori; Kan, Fumitaka; Suematsu, Kohshi; and Imai, Eiichi, to Canon Kabushiki Kaisha. Method for coating a non-magnetic developer onto a developer holding member. 4,571,372, Cl. 430-122.000.
Urayama, Yumiko: *See*—
Takagi, Shigeki; and Urayama, Yumiko, 4,571,256, Cl. 71-28.000.
Urban Transportation Development Corp. Ltd.: *See*—
Smith, Roy E., 4,570,544, Cl. 105-165.000.
Usami, Takashi: *See*—
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.
USC: *See*—
Rodriguez-Pena, Alonso; Cheng, Tsen-Chung; and Wu, Chuck Y., 4,571,539, Cl. 324-72.000.
Ushio Denki Kabushiki Kaisha: *See*—
Arai, Tetsuji; and Mimura, Yoshiki, 4,571,486, Cl. 219-354.000.
USI Agri-Business Company Inc.: *See*—
Burkholder, Harvey Z., 4,570,574, Cl. 119-17.000.
USM Corporation: *See*—
Richmond, John F.; Mauer, Dieter; and Baum, Heinz O., 4,570,303, Cl. 24-16.0PB.
Swasey, Archie N.; and Winter, William J., 4,571,096, Cl. 384-266.000.
V.E. Kuster Company: *See*—
McLaurin, Lauchlin A., 4,570,481, Cl. 73-152.000.
Vahlensieck, Hans-Joachim: *See*—
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,571,427, Cl. 556-476.000.
Valentine, Al L. Quick change adapter. 4,570,951, Cl. 279-1.00R.
Valentino, Pasquale A.; Stangel, John J.; and Donelin, Dwayne D., to United States of America, Navy. Three dimensional, orthogonal delay line bootlace lens antenna. 4,571,591, Cl. 343-754.000.
Valeo: *See*—
Alas, Jacques; and Bacher, Michel, 4,570,772, Cl. 192-70.180.
Caray, Andre ; and Renaud, Pierre, 4,570,775, Cl. 192-106.200.
Loizeau, Pierre, 4,570,774, Cl. 192-106.200.
Valimukhametova, Dania A.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.
Valmet-Dominion Inc.: *See*—
Rebas, Erich, 4,571,283, Cl. 162-344.000.
Vambenepe, Guy: *See*—
Baumaire, Alain; Desmas, Thierry; and Vambenepe, Guy, 4,570,489, Cl. 73-658.000.
Vance, Ian A. W., to Standard Telephones and Cables plc. Demodulator logic for frequency shift keyed signals. 4,571,738, Cl. 375-82.000.
Vanderjagt, John A. Pumping system. 4,570,833, Cl. 222-333.000.
Van Egmond, Cor F.: *See*—
Van Meurs, Peter; and Van Egmond, Cor F., 4,570,715, Cl. 166-302.000.
Vanlandingham, Robert E.: *See*—
Giboney, George W.; Vanlandingham, Robert E.; and Grimshaw, James L., 4,570,966, Cl. 280-433.000.
Van Meurs, Peter; and Van Egmond, Cor F., to Shell Oil Company. Formation-tailored method and apparatus for uniformly heating long subterranean intervals at high temperature. 4,570,715, Cl. 166-302.000.
van Mil, Martinus P. G., to Stork PMT B.V. Apparatus for transferring slaughtered poultry. 4,570,295, Cl. 17-11.000.
Van Peteghem, Willy F.: *See*—
De Schamphelaere, Lucien A.; Librecht, Freddy M.; Van Peteghem, Willy F.; and De Cock, Etienne M., 4,571,602, Cl. 346-160.000.
Varasso, Eugene C.: *See*—
Higginbotham, James M., Jr.; Varasso, Eugene C.; Rapp, Kenneth L.; and Sunkle, Thomas H., 4,571,587, Cl. 340-825.530.
Varian Associates, Inc.: *See*—
Lee, Jenson K. S.; and Vora, Mahasukh, 4,571,588, Cl. 340-870.130.
Veling, Thomas R.; Wiklund, George C.; and Park, Kwang H., to Ford Motor Company. Method of attaching a tube to a fin. 4,570,317, Cl. 29-157.30A.
Velo-Bind, Inc.: *See*—
Szanto, Elmer G.; Davio, Franklin J.; and Wallace, Lloyd V., 4,570,351, Cl. 33-180.00R.
Vepa Aktiengesellschaft: *See*—
Fleissner, Heinz, 4,570,361, Cl. 34-115.000.
Verhoff, Francis K.: *See*—
Bonasso, Jack I.; Harper, James T.; and Verhoff, Francis K., 4,571,249, Cl. 48-73.000.
Verlander, Michael S.; Fuller, William D.; and Goodman, Murray, to Cumberland Packing Corp. 1,1-Diaminoalkane derived sweeteners. 4,571,345, Cl. 426-548.000.
Vermonet, Christian, to Societe Technisynthese s.a.r.l. Elastomeric support surface with a network of sculptures, notably a so-called "marine" shoe sole. 4,570,362, Cl. 36-59.00C.
Verton, Jose , to Champion Spark Plug Europe S.A. Wiper blade with air deflecting device. 4,570,284, Cl. 15-250.420.
Vibrachoc: *See*—
Debrabander, Armand, 4,571,016, Cl. 339-17.00D.
Vibro-Meter SA: *See*—
Lustenberger, Martin, 4,570,881, Cl. 244-134.00F.
Victor Company of Japan Ltd.: *See*—
Fukuda, Hisatoshi, 4,571,613, Cl. 358-36.000.
Namiki, Yasuomi, 4,571,643, Cl. 360-66.000.
Victoria, Henry J.: *See*—
Ferrante, Joseph G.; Victoria, Henry J.; and Mileos, George, 4,571,340, Cl. 426-393.000.
Victoria University of Manchester, The: *See*—
Roe, Geoffrey E., 4,570,586, Cl. 123-192.00B.
Vikesland, John P., to Minnesota Mining and Manufacturing Company. Multilayer dry-film positive-acting laminable photoresist with two photoresist layers wherein one layer includes thermal adhesive. 4,571,374, Cl. 430-156.000.
Viking Corporation, The: *See*—
Retzloff, James G.; and Sanders, Gerald W., 4,570,720, Cl. 169-39.000.
Vinegar, Harold J.; and Wellington, Scott L., to Shell Oil Company. Method of imaging the atomic number of a sample. 4,571,491, Cl. 250-252.100.
Virginia Panel Corporation: *See*—
Stowers, Jeffery P.; and Moore, Thomas W., 4,571,540, Cl. 324-158.00P.
Vizsolyi, Andrew I.: *See*—
Bruynesteyn, Albert; Hackl, Ralph P.; Lawrence, Richard W.; and Vizsolyi, Andrew I., 4,571,387, Cl. 435-262.000.
Vock, Manfred H.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,571,343, Cl. 426-535.000.
Vogel, Alan D., to Pace, Inc. Electric resistance heater assembly for soldering and desoldering devices. 4,571,482, Cl. 219-237.000.
Vogel, Gerald J.: *See*—
Katz, Saul N.; and Vogel, Gerald J., 4,571,339, Cl. 426-387.000.
Vogelsberg, Dieter; and Feese, Wolfgang, to Siemens Aktiengesellschaft. Two-stage twisting device for communication cables. 4,570,432, Cl. 57-293.000.
Vogl, Kurt. Locking ring binder mechanism with control slide. 4,571,108, Cl. 402-38.000.
Vogtlander, Alfred, to Falk-Verlag fur Landkarten und Stadtplane Gerhard Falk GmbH. Process and apparatus for folding a sheet longitudinally and transversely. 4,571,237, Cl. 493-416.000.
Volkmann, Klaus, to Krautkramer-Branson, Inc. Ultrasonic thickness gauge circuit with transit path correction. 4,570,486, Cl. 73-597.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Husmann, Horst, 4,570,762, Cl. 188-82.840.
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, to Bayer Aktiengesellschaft. Constructional material. 4,570,622, Cl. 128-90.000.
von Gizycki, Ulrich: *See*—
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,570,622, Cl. 128-90.000.
Von Holdt, John W. Mold for container with recess-defining flange. 4,570,897, Cl. 249-144.000.
von Philipsborn, Gerda: *See*—
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.
von Praun, Ferdinand: *See*—
Gude, Fritz; and von Praun, Ferdinand, 4,571,426, Cl. 549-257.000.

Vora, Mahasukh: *See—*
Lee, Jenson K. S.; and Vora, Mahasukh, 4,571,588, Cl. 340-870.130.

Voss, Roger N.: *See—*
Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., 4,571,090, Cl. 366-270.000.

W. S. Shamban & Company: *See—*
Traub, Henry A., 4,570,944, Cl. 277-121.000.

W. Schlafhorst & Co.: *See—*
Kohlen, Karl-Heinz, 4,570,867, Cl. 242-35.60R.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Klatt, Alfred, 4,570,502, Cl. 74-335.000.

Wacker-Chemie GmbH: *See—*
Hockemeyer, Friedrich; John, Peter; Muller, Johann; and Preiner, Gerhard, 4,571,349, Cl. 427-54.100.
Kunstle, Gerhard; and Jung, Herbert, 4,571,433, Cl. 564-4.000.

Wada, Masashi, to Toyko Shibaura Denki Kabushiki Kaisha. Nonvolatile semiconductor memory device with electrically selectable, erasable and programmable function. 4,571,705, Cl. 365-195.000.

Wada, Yoshimi, to Nissan Motor Co., Ltd. Apparatus for stopping weaving machine at predetermined position. 4,570,681, Cl. 139-1.00E.

Wagner, Bernd: *See—*
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.

Wagner, Kuno: *See—*
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,570,622, Cl. 128-90.000.

Wagner, Thomas R.: *See—*
Gudlauski, Edward B.; and Wagner, Thomas R., 4,571,089, Cl. 366-139.000.

Wahlberg, Arvo. Method for producing fertilizer from tree ash and softwood bark or from other tree waste. 4,571,254, Cl. 71-24.000.

Wakabayashi, Hiroshi, to Nippon Kogaku K.K. Film feed control device in a camera. 4,571,044, Cl. 354-173.110.

Wakabayashi, Toshio: *See—*
Yoshida, Tsunemasa; Wakabayashi, Toshio; and Matsumoto, Keizo, 4,571,334, Cl. 424-95.000.

Wakasaki, Miyoshi: *See—*
Ishii, Takashi; Murata, Shinichi; Kusagawa, Shiro; and Wakasaki, Miyoshi, 4,570,695, Cl. 164-463.000.

Wakikaido, Takahiro: *See—*
Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, 4,571,062, Cl. 355-8.000.

Walden, Fred O., to Pacific Fence & Wire Co. Slat assembly for chain link fence. 4,570,906, Cl. 256-34.000.

Waldo, Russell W.; Miller, Cardell E.; Huot, Louis D.; and Engstrom, George L., to Ideal Security Hardward Corporation. Locking apparatus for use with a panel slideable in a plane. 4,570,985, Cl. 292-262.000.

Waldorf, Raymond D., to Ford Motor Company. Dual flow variable assist power steering gear mechanism. 4,570,736, Cl. 180-143.000.

Walker, Brooks. Carrier for suitcases, luggage, garment bags, and the like. 4,570,958, Cl. 280-40.000.

Walker, James D., to General Motors Corporation. Method and apparatus for loading and unloading sheet molding compound in and from a press. 4,571,320, Cl. 264-40.100.

Walkhoff, Klaus, to Raichle Sportschuh AG. Article of athletic footwear, especially a ski boot. 4,570,364, Cl. 36-121.000.

Wallace, Lloyd V.: *See—*
Szanto, Elmer G.; Davio, Franklin J.; and Wallace, Lloyd V., 4,570,351, Cl. 33-180.00R.

Wallace, Rodney L., to Union Carbide Corporation. Tubular core for a shirred casing article. 4,570,292, Cl. 17-1.00R.

Walling, John B. Sheave drive assembly for flexible production tubing. 4,570,705, Cl. 166-77.000.

Walsh, Myles A. Electrochemical flowmeter. 4,570,492, Cl. 73-861.050.

Walter, Arthur, to Erwin Sick GmbH Optik-Elektronik. Fault prewarning device for use in carpet manufacturing machines. 4,571,582, Cl. 340-677.000.

Walter, Lothar: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Walter, Lothar, 4,570,773, Cl. 192-98.000.

Walter, Robert J.: *See—*
Wooten, John R.; Walter, Robert J.; and Shaw, Thomas M., 4,571,086, Cl. 366-127.000.

Walter Schneider GmbH & Co. KG: *See—*
Kerschner, Engelbert; and Muschelknautz, Edgar, 4,570,287, Cl. 15-346.000.

Walton, Mark D., to Aluminum Company of America. Microwave examination of semiconductive shields. 4,571,544, Cl. 324-58.50R.

Wang, Ta-Lung. Stunt toy device. 4,571,204, Cl. 446-138.000.

Ward, David J., to Evode Limited. Apparatus for extruding a fillet. 4,570,834, Cl. 222-566.000.

Ward, Michael D.; Brazdil, James F., Jr.; and Grasselli, Robert K., to Standard Oil Company (Ohio), The. Process for the selective oxidation of olefins with photochemical illumination of semiconductor powder suspensions. 4,571,290, Cl. 204-157.690.

Ward, Sarah G.: *See—*
Taylor, Robert C.; Ward, Sarah G.; and Schmidt, Parbury P., 4,571,335, Cl. 424-131.000.

Warner-Lambert Company: *See—*
Hutt, Marland P.; Mich, Thomas F.; and Culbertson, Townley P., 4,571,396, Cl. 514-249.000.

Warner & Swasey Company, The: *See—*
Leitch, Paul A.; Chang, Robert C.; and Thompson, Randy E., 4,570,389, Cl. 51-325.000.

Warren, Brian T.: *See—*
Abram, Trevor S.; Norman, Peter; and Warren, Brian T., 4,571,405, Cl. 514-437.000.

Warren Company: *See—*
Meiser, Sue M.; and Cassidy, Michael F., 4,570,936, Cl. 273-157.00R.

Wasco Products, Inc.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,570,394, Cl. 52-72.000.

Washington Innovative Technology, Inc.: *See—*
Trager, Wesley H., 4,571,551, Cl. 330-10.000.

Watabe, Akinori: *See—*
Kato, Kikuji; Watabe, Akinori; Ukita, Hiroo; and Yonezawa, Susumu, 4,571,715, Cl. 369-45.000.

Watanabe, Hideaki: *See—*
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, 4,571,408, Cl. 514-546.000.

Watanabe, Hiroshi: *See—*
Morimoto, Kiyoshi; and Watanabe, Hiroshi, 4,571,523, Cl. 313-497.000.

Watanabe, Kazuo: *See—*
Takaoka, Michio; Mohtai, Tsuneaki; Yoshida, Syotaroh; and Watanabe, Kazuo, 4,571,453, Cl. 174-110.00A.

Watanabe, Kozo; Kawada, Masashi; and Okada, Yozo, to Yoshida Kogyo K.K. Apparatus for bundling elongate articles. 4,570,422, Cl. 53-557.000.

Watanabe, Masaki: *See—*
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,570,506, Cl. 74-501.50R.

Watanabe, Shoji: *See—*
Uetsuji, Yonekazu; and Watanabe, Shoji, 4,570,584, Cl. 123-179.0SE.

Watanabe, Takao, to Nippon Electric Co., Ltd. Apparatus for calculating pattern dissimilarity between patterns. 4,571,697, Cl. 364-561.000.

Watanabe, Takayuki, to NEC Corporation. Memory circuit with improved redundant structure. 4,571,707, Cl. 365-200.000.

Watanabe, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic bank note transaction apparatus. 4,571,489, Cl. 235-379.000.

Watanabe, Yoshimi; Tada, Yukio; Suzuki, Takanori; and Suzuki, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Internal combustion engine. 4,570,587, Cl. 123-193.00P.

Waterloo Industries, Inc.: *See—*
Oltman, John P.; Kreger, Steven J.; and Purchase, Richard D., 4,570,392, Cl. 52-64.000.

Watts, Edward W.: *See—*
Barbato, Michael W.; Rhodes, Tony; and Watts, Edward W., 4,571,198, Cl. 446-73.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Furst, Arpad; and Igel, Richard, 4,570,992, Cl. 296-223.000.

Webb, Claymon D., to R. R. Donnelley & Sons Company. Press dampening system. 4,570,538, Cl. 101-148.000.

Weber, Benno, to AG fur industrielle Elektronik Agie. Method for securing cut pieces in spark erosive cutting. 4,571,477, Cl. 219-69.00M.

Weber, Jurg, to BBC Brown, Boveri & Company, Limited. Device for adjusting the turbine inlet flow cross-section of an exhaust gas turbocharger. 4,571,154, Cl. 415-158.000.

Weber, Jurgen: *See—*
Tuneke, Wilhelm; and Weber, Jurgen, 4,570,410, Cl. 52-811.000.

Weber, Rolf; Pollak, Gerd; and Chlechowitz, Arno, to L. & C. Steinmuller GmbH. Connection anchor for liner of cast iron pressure tank. 4,570,813, Cl. 220-3.000.

Weetman, Ronald J.; Carpenter, Jerry A.; Coyle, Chandler K.; McDermott, Keith T.; and Voss, Roger N., to General Signal Corp. Mixing systems. 4,571,090, Cl. 366-270.000.

Wehr Corporation: *See—*
Hendricks, Wayne D., 4,570,758, Cl. 188-72.300.

Wein, Franz, to Maschinenfabrik Reinhausen Gebruder Scheubeck GmbH & Co. KG. Circuit arrangement for switchover of load between different sources of alternating voltage. 4,571,499, Cl. 307-75.000.

Weinig, Lee A.: *See—*
Burmeister, Harland A.; and Weinig, Lee A., 4,570,518, Cl. 83-504.000.

Weinman, Milton. Adhesive tape carrier for purse or pocket and method for making same. 4,570,797, Cl. 206-447.000.

Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., to Sherritt Gordon Mines Limited. Recovery of gold from refractory auriferous iron-containing sulphidic concentrates. 4,571,263, Cl. 75-101.00R.

Weir, Donald R.; and Genik-Sas-Berezowsky, Roman M., to Sherritt Gordon Mines Limited. Recovery of gold from refractory auriferous iron-containing sulphidic ore. 4,571,264, Cl. 75-101.00R.

Weir, Donald R.: *See—*
Kerfoot, Derek G. E.; Kofluk, Russell P.; and Weir, Donald R., 4,571,262, Cl. 75-101.00R.

Weis, Helmar: *See—*
Diedrich, Klaus; and Weis, Helmar, 4,571,073, Cl. 355-89.000.

Weisgerber, Robert G. Construction for a belt buckle. 4,570,308, Cl. 24-163.00K.

Weiss, Roger E.: *See—*
Robin, Max S.; Tamburro, Peter J.; and Weiss, Roger E., 4,571,014, Cl. 339-14.00R.

Weissman, Bernard, to Ipco Corporation. Dental post for retention of a prosthetic superstructure. 4,571,187, Cl. 433-221.000.

Weitzel, Richard A.: *See—*
Robinson, Kelly S.; Weitzel, Richard A.; and Kroll, Arthur S., 4,570,572, Cl. 118-657.000.

Weld Tooling Corporation: *See—*
Cable, Harold E.; and Rodrigues, Anil N., 4,570,542, Cl. 104-119.000.

Weldon, William F., to University of Texas System. Inductive store opening switch. 4,571,468, Cl. 200-61.080.

Wellington, Scott L.: *See—*
Vinegar, Harold J.; and Wellington, Scott L., 4,571,491, Cl. 250-252.100.

Wendt, Alan C., to United States Gypsum Company. Partition system adapted to support a cantilevered load. 4,570,390, Cl. 52-36.000.

Wendt, Charles W.; Shroder, Joseph D.; and Gerst, Michael D., to Fats and Proteins Research Foundation, Inc. Method of promoting seedling emergence of field-planted, small-seeded crops. 4,570,378, Cl. 47-9.000.

Wentink, James T. Panel lite insert system. 4,570,399, Cl. 52-208.000.

Wenzel, Werner, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Device for raising fish into uniform, upright belly-back position. 4,570,784, Cl. 198-399.000.

Wepfer, Robert M., to Westinghouse Electric Corp. Tube support grid. 4,570,883, Cl. 248-49.000.

Werner & Pfleiderer: *See—*
Rudolph, Joachim, 4,570,359, Cl. 34-58.000.

Wernhart, Hans. Agricultural aerial water sprayer. 4,570,854, Cl. 239-189.000.

Wess, Othmar, to Dornier System GmbH. Shockwave reflector. 4,570,634, Cl. 128-328.000.

Wesselink, Gustaaf A., to U.S. Philips Corporation. Low-pressure discharge lamp with cooled internal ballast. 4,571,526, Cl. 315-56.000.

Westinghouse Brake & Signal Company: *See—*
Wickham, David J., 4,571,008, Cl. 303-33.000.

Westinghouse Electric Corp.: *See—*
Bennett, R. James, 4,571,590, Cl. 343-7.0AG.
Fey, Maurice G.; Fatum, John H.; and Meyer, Thomas N., 4,571,259, Cl. 75-10.00R.
Gyugyi, Laszlo, 4,571,535, Cl. 323-211.000.
Kappenhagen, George A., 4,570,781, Cl. 198-333.000.
Kennon, Jerry M., 4,571,691, Cl. 364-483.000.
Orndorff, Karl B.; and Sherwood, Edward F., 4,570,754, Cl. 187-1.00R.
Soroka, Daniel P.; and Stoutamire, Mark S., 4,571,149, Cl. 414-750.000.
Wepfer, Robert M., 4,570,883, Cl. 248-49.000.

Westvaco Corporation: *See—*
Forbes, Hampton E., Jr., 4,570,787, Cl. 206-45.140.
Groom, James S., 4,570,796, Cl. 206-449.000.
Lege, Curtis S., 4,571,309, Cl. 260-400.000.

Wetter, Kurt, to Rieter Machine Works Limited. Noise protection device for a winding unit. 4,570,743, Cl. 181-200.000.

Wheeler, Louis B.: *See—*
Ferguson, William B., Jr.; Bresowar, Gerald E.; and Wheeler, Louis B., 4,571,311, Cl. 261-64.00B.

Whicker, Jerry T.: *See—*
Bloome, James A.; Meeker, Rick A.; Whicker, Jerry T.; and Foreman, Frederick J., 4,570,278, Cl. 15-97.00R.

White, J. Matthew: *See—*
Patil, Bhalchandra B.; and White, J. Matthew, 4,571,116, Cl. 404-76.000.

White, James T., Sr.; and Kennedy, Dan J., to Reichhold Chemicals, Incorporated. Water soluble one-component polymeric resin binder system for fiberglass mats. 4,571,356, Cl. 428-143.000.

White, Scott C.: *See—*
Nelson, Robert N.; Olds, Keith A.; and White, Scott C., 4,571,514, Cl. 307-234.000.

White, William H.: *See—*
Ashlock, Lysander T.; Mukamal, Harold; and White, William H., 4,571,365, Cl. 428-412.000.

White, William J.: *See—*
Paine, Christopher G.; White, William J.; and Resnick, Susan J., 4,570,329, Cl. 29-572.000.

Whitener, Charles G., Jr. Method and apparatus for producing entangled yarn. 4,570,312, Cl. 28-271.000.

Whitwam, Ronald L.; and Pergler, Charles C., to Steelcase, Inc. Chair control tension adjustment assembly. 4,570,895, Cl. 248-575.000.

Wickham, David J., to Westinghouse Brake & Signal Company. Control valve arrangement. 4,571,008, Cl. 303-33.000.

Widerker, Martin. Pocket chair. 4,570,993, Cl. 297-17.000.

Widner, Ronald L.: *See—*
Lee, Peter W.; Kreider, Gary E.; and Widner, Ronald L., 4,571,097, Cl. 384-469.000.

Widra, Abe, to University of Illinois Foundation. Hydrophilic biopolymeric copolyelectrolytes, and biodegradable wound dressing comprising same. 4,570,629, Cl. 128-156.000.

Wiersdorff, Walter-Wielant: *See—*
Franke, Albrecht; Mueller, Josef; Lietz, Helmut; Wiersdorff, Walter-Wielant; Hege, Hans-Guenther; Mueller, Claus D.; Gries, Josef; Lenke, Dieter; von Philipsborn, Gerda; and Raschack, Manfred, 4,571,409, Cl. 514-652.000.

Wiggs, Christopher C.; and Taylor, Christopher J. C. Dispenser for adhesive labels. 4,570,868, Cl. 242-55.530.

Wiklund, George C.: *See—*
Veling, Thomas R.; Wiklund, George C.; and Park, Kwang H., 4,570,317, Cl. 29-157.30A.

Wilbur, David L.: *See—*
Fenoglio, John C.; Wilbur, David L.; and Anthony, William H., 4,571,368, Cl. 428-654.000.

Wilcox, Roger F.: *See—*
Gregorious, David J.; Wilcox, Roger F.; and Burr, Roland R., 4,570,842, Cl. 228-48.000.

Wild Heerbrugg Aktiengesellschaft: *See—*
Ziegler, Klaus; Zund, Peter; Gees, Jurg; and Mader, Josef, 4,571,028, Cl. 350-287.000.

Wilhelm Staub GmbH, Firma: *See—*
Diedrich, Klaus; and Weis, Helmar, 4,571,073, Cl. 355-89.000.

Wilk, David A., deceased (by Wilk, Lois, executrix), to Grinnell Fire Protection Systems Company, Inc. Dry pipe valve accelerator. 4,570,719, Cl. 169-20.000.

Wilk, Lois, executrix: *See—*
Wilk, David A., deceased, 4,570,719, Cl. 169-20.000.

Wilke, Raud A., to Koehring Company. Hydraulic control valve with independently operable bypass valve. 4,570,672, Cl. 137-596.130.

Wilkie, Donald S. Apparatus for assembling conveyor chain. 4,570,436, Cl. 59-7.000.

Wilkinson, James H., to Sony Corporation. Digital random error generator supplying burst error signals of random durations starting at random times. 4,571,546, Cl. 328-61.000.

Wilks, David R., to Palm Harbor Homes, Inc. Foundation system for modular and mobile housing. 4,570,409, Cl. 52-742.000.

Willi Studer, AG: *See—*
Studer, Willi; and Stosberg, Arturo E., 4,571,529, Cl. 318-327.000.

Wm. Steinen Mfg. Co.: *See—*
Aprea, George F.; and Pohle, Werner P., 4,570,860, Cl. 239-478.000.

Williams, Bernhard O.: *See—*
O'Neil, Robert A.; Broman, William G.; Clouser, Leon C.; Dombrowski, Adrian T.; Harth, Arthur R.; and Williams, Bernhard O., 4,570,793, Cl. 206-371.000.

Williams, George, to Brigade Quartermasters, Ltd. Security wallet. 4,570,688, Cl. 150-134.000.

Willson, David H., to AMSTED Industries Incorporated. Relieving pressure differential in vacuum filter. 4,571,302, Cl. 210-791.000.

Wilson, James D. Stackable container for use in bakery goods distribution systems, and the like. 4,570,798, Cl. 206-505.000.

Wilson Sporting Goods Co.: *See—*
Martin, Robin A., 4,570,931, Cl. 273-65.0EG.

Wilson, William G. Methods of pouring metal. 4,570,692, Cl. 164-56.100.

Wilt, Morgan L., to Combustion Engineering, Inc. Water cooled door. 4,570,550, Cl. 110-180.000.

Wingenfeld, Friedrich: *See—*
Gudat, Gerhard; Blascyk, Gotthardt; and Wingenfeld, Friedrich, 4,571,176, Cl. 432-226.000.

Winkler, David H.; and Winkler, Donna K. Roller skate assembly with an interchangeable body. 4,570,955, Cl. 280-11.200.

Winkler, Donna K.: *See—*
Winkler, David H.; and Winkler, Donna K., 4,570,955, Cl. 280-11.200.

Winteler, Hans R.; and Favre, Charles-Andres. Sonic temperature warning device for lids of cooking vessels. 4,571,580, Cl. 340-594.000.

Winter, William J.: *See—*
Swasey, Archie N.; and Winter, William J., 4,571,096, Cl. 384-266.000.

Wise, Paul H.: *See—*
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,570,938, Cl. 273-243.000.

Witkowski, Joseph T.: *See—*
Sunday, Brooks R.; and Witkowski, Joseph T., 4,571,402, Cl. 514-336.000.

Witsken, Anthony: *See—*
Knox, Arthur C., Jr.; Hokanson, Allan E.; and Witsken, Anthony, 4,570,863, Cl. 241-33.000.

Wittenberg, Mark S.: *See—*
Henderson, Richard E.; and Wittenberg, Mark S., 4,571,207, Cl. 446-352.000.

Wittrisch, Christian, to Institut Francais du Petrole. Method and device for effecting, by means of specialized tools, such operations as measurements in highly inclined to the vertical or horizontal well portions. 4,570,709, Cl. 166-250.000.

Wojnarowski, Robert J.: *See—*
Eichelberger, Charles W.; Wojnarowski, Robert J.; and Auerbach, Abraham, 4,571,322, Cl. 264-154.000.

Wolf, James B. Tooth cleaning and flossing device. 4,570,653, Cl. 132-91.000.

Wolfe, Brian A.: *See—*
Meyer, David L.; and Wolfe, Brian A., 4,570,326, Cl. 29-566.300.

Wong, Albert C.: *See—*
Masica, Michael T.; Wong, Albert C.; and Yonker, John F., 4,570,667, Cl. 137-117.000.

Wong, Hon; and Tsui, Shui K. Swivel eyebolt. 4,570,987, Cl. 294-1.100.

Wood, Earl M., Jr.: *See—*
Mayer, John F.; Cook, Stuart A.; Springer, Harvey G.; and Wood, Earl M., Jr., 4,571,206, Cl. 446-330.000.

Wood, Godfrey A.: *See—*
Ahern, Ronald A.; Dyett, Derek H.; Labbe, Francis A. M.; and Wood, Godfrey A., 4,570,644, Cl. 131-109.00R.

Wood, Kenneth G. Finger manipulated dispenser of viscous liquids from a flexible tube. 4,570,828, Cl. 222-100.000.

Woodland, Carl R., to Dayco Corporation. Endless power transmission belt having a toothed compression section and method of making the same. 4,571,230, Cl. 474-264.000.

Woods, Randall L. Cystotome for eye surgery and method of opening lens capsule. 4,570,632, Cl. 128-305.000.

Woolley, Edward N. Swimming pool alarm. 4,571,579, Cl. 340-566.000.

Wooten, John R.; Walter, Robert J.; and Shaw, Thomas M., to Rockwell International Corporation. Mixing of ceramic powders. 4,571,086, Cl. 366-127.000.

Worley, Wm. Spencer: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, Wm. Spencer; and Gerbert, Goran, 4,571,216, Cl. 474-8.000.

Wortman, Donald E.; and Leavitt, Richard P., to United States of America, Army. High performance orotron utilizing a dense electron beam. 4,571,726, Cl. 372-2.000.

Wright, Dale E., to Boeing Company, The. Tube end squareness projector apparatus. 4,571,084, Cl. 356-391.000.

Wright State University: *See*—
Petrofsky, Jerrold S.; Phillips, Chandler A.; and Heaton, Harry H., III, 4,570,927, Cl. 272-73.000.

Wrona, James: *See*—
Higgins, George D.; and Wrona, James, 4,570,535, Cl. 100-7.000.

Wu, Chuck Y.: *See*—
Rodriguez-Pena, Alonso; Cheng, Tsen-Chung; and Wu, Chuck Y., 4,571,539, Cl. 324-72.000.

Wu, Chyuan-Jong. Electronic music pace-counting shoe. 4,571,680, Cl. 364-410.000.

Wu, Kent K., to Henry Ford Hospital. Intervertebral body wire stabilization. 4,570,618, Cl. 128-69.000.

Wu, Kent K., to Henry Ford Hospital. Universal guide for inserting parallel pins. 4,570,624, Cl. 128-92.0EB.

Wunderlich, Ernst; and Robl, Gerd, to Rehau AG and Co. Plastic profiled sealing element for household refrigeration appliances. 4,570,948, Cl. 277-226.000.

Wurster u. Dietz GmbH u. Co. Maschinenfabrik: *See*—
Dietz, Hans, 4,570,687, Cl. 144-378.000.

Wyatt, Richard G.: *See*—
Greenberg, Harry B.; Wyatt, Richard G.; Kapikian, Albert Z.; Kalica, Anthony R.; Midthun, Karen; and Chanock, Robert M., 4,571,385, Cl. 435-172.300.

Wynnyckyj, John R.; Rhodes, Edward; and Chambers, Allan K., to University of Waterloo. Furnace wall ash monitoring system. 4,571,094, Cl. 374-29.000.

Wyslouzil, Walter; and Kashyap, Satish C., to Canadian Patents & Development Limited-Societe Canadienne des Brevets et d'Exploitation Limitee. Microwave applicator for frozen ground. 4,571,473, Cl. 219-10.55A.

Wysocki, Lawrence S., to Champion International Corporation. Paperboard frame with lockable corners. 4,570,844, Cl. 229-16.00D.

Xerox Corporation: *See*—
Bares, Jan, 4,571,060, Cl. 355-3.0DD.
Bowler, Edward F., Jr., 4,571,054, Cl. 355-3.0SH.
Eisler, David, 4,570,918, Cl. 271-3.100.
Lama, William L.; and Rees, James D., 4,571,022, Cl. 350-96.250.
Lehman, Richard F., 4,571,058, Cl. 355-3.00R.
Masham, Roger D., 4,570,570, Cl. 118-612.000.
Rezanka, Ivan, 4,571,599, Cl. 346-140.00R.

Yabunaka, Kiyoshi: *See*—
Hamano, Isao; Morishita, Akira; Akae, Yoshifumi; Nishimura, Youji; Tanaka, Toshinori; and Yabunaka, Kiyoshi, 4,570,583, Cl. 123-179.00K.

Yabusaki, Masayoshi: *See*—
Goto, Shobun; Sugihara, Jiro; and Yabusaki, Masayoshi, 4,571,167, Cl. 425-289.000.

Yagasaki, Toshiaki: *See*—
Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.

Yamada, Hajime: *See*—
Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, 4,571,721, Cl. 370-56.000.

Yamada, Mikio, to Sumitomo Rubber Industries, Ltd. Two piece solid golf ball. 4,570,937, Cl. 273-220.000.

Yamada, Sadami; and Tamura, Kaoru, to Fuji Photo Film Co., Ltd. Extracting device for extracting contents from bag-like container. 4,571,140, Cl. 414-412.000.

Yamada, Takahiro, to Matsushita Electric Industrial Co., Ltd. Solid state area imaging apparatus. 4,571,626, Cl. 358-213.000.

Yamada, Toshiro; Sakai, Noriyasu; and Kawase, Hisao, to Nisshin Steel Co., Ltd. Hot-dip aluminum coated steel strip having excellent strength and oxidation resistance at elevated temperatures and process for production thereof. 4,571,367, Cl. 428-653.000.

Yamada, Yasuyuki: *See*—
Kasuga, Akira; Matsufuji, Akihiro; Yamada, Yasuyuki; and Tsuji, Nobuo, 4,571,364, Cl. 428-336.000.

Yamaguchi, Hiorji; Hori, Takanobu; and Hayashi, Masaharu, to Aisin Seiki Kabushiki Kaisha. Viscous fluid coupling having centrifugal valve means. 4,570,771, Cl. 192-58.00B.

Yamaguchi, Keisaku: *See*—
Saito, Koetsu; Kawabuchi, Masami; Yamaguchi, Keisaku; and Iijima, Keiji, 4,571,520, Cl. 310-327.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Grinde, James E.; and Foote, Douglas C., 4,570,738, Cl. 180-196.000.

Yamakawa, Tadashi: *See*—
Kasama, Nobuhiro; Kurata, Mitsuru; Tanioka, Hiroshi; Yamakawa, Tadashi; Inoue, Yutaka; Hosaka, Masao; and Yagasaki, Toshiaki, 4,571,053, Cl. 355-3.00R.

Yamamoto, Hiroshi; Satoh, Shuichi; Iwai, Yoshiyuki; Ae, Osamu; Suda, Masao; Shiozaki, Minoru; Tsuchiya, Kiyoshi; Nakano, Manabu; Ogata, Kojiro; Miyanagi, Naoki; Ono, Kozo; and Tobita, Nobuyuki, to Nippon Telegraph & Telephone Public Corp.; and Hitachi Construction Machinery Co., Ltd. Pipe laying apparatus. 4,571,122, Cl. 405-184.000.

Yamamoto, Hiroyuki: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, 4,571,357, Cl. 428-153.000.

Yamamoto, Keisuke: *See*—
Iyehara, Sadahiro; Inohara, Shizuo; Masuda, Mitsuya; Ueda, Minoru; and Yamamoto, Keisuke, 4,571,614, Cl. 358-56.000.

Yamamoto, Masaki: *See*—
Takanabe, Kazunori; Yamamoto, Masaki; Ito, Kenzo; and Fujinami, Hiroshi, 4,571,684, Cl. 364-449.000.

Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki. Operating wire control device for a brake system. 4,570,506, Cl. 74-501.50R.

Yamamoto, Takayuki: *See*—
Take, Tokio; Sonoda, Satoshi; and Yamamoto, Takayuki, 4,570,593, Cl. 123-398.000.

Yamanaka, Kimio: *See*—
Hirayama, Mitsunori; and Yamanaka, Kimio, 4,571,677, Cl. 364-200.000.

Yamanouchi, Shosuke: *See*—
Hata, Ryosuke; Yamanouchi, Shosuke; Hirose, Masayuki; Kuwabara, Hidemitsu; Yamamoto, Hiroyuki; and Mizumoto, Yasuharu, 4,571,357, Cl. 428-153.000.

Yamasaki, Masafumi: *See*—
Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, 4,571,049, Cl. 354-410.000.

Yamashita, Masataka, to Canon Kabushiki Kaisha. Photoconductive film and electrophotographic photosensitive member using said film comprising silylated azo pigment. 4,571,369, Cl. 430-56.000.

Yamashita, Takeo: *See*—
Fujiwara, Hideo; Otomo, Shigekazu; Shinagawa, Kiminari; Kumasaka, Noriyuki; Yamashita, Takeo; Kudo, Mitsuhiro; and Tamura, Teizo, 4,571,652, Cl. 360-122.000.

Yamato Scale Company, Limited: *See*—
Toyoda, Yoshiharu, 4,570,728, Cl. 177-25.000.

Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kuniko, to Eisai Co., Ltd. α,β-Dihydropolyprenyl derivatives for treating hepatitis. 4,571,408, Cl. 514-546.000.

Yamauchi, Takahiko: *See*—
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, 4,571,510, Cl. 307-449.000.

Yamauchi, Yoshiyuki: *See*—
Ohara, Toshio; Fukumi, Sigenobu; and Yamauchi, Yoshiyuki, 4,570,700, Cl. 165-134.100.

Yamauchi, Yutaka, to Sharp Kabushiki Kaisha. Method of forming contact to thin film semiconductor device. 4,570,332, Cl. 29-586.000.

Yamazaki, Hisashi: *See*—
Arakawa, Satoshi; Yamazaki, Hisashi; Yamazaki, Kikuo; and Matsuda, Terumi, 4,571,496, Cl. 250-484.100.

Yamazaki, Kikuo: *See*—
Arakawa, Satoshi; Yamazaki, Hisashi; Yamazaki, Kikuo; and Matsuda, Terumi, 4,571,496, Cl. 250-484.100.

Yamazaki, Shunpei, to Semiconductor Energy Co., Ltd. Photoelectric conversion panel and assembly thereof. 4,571,446, Cl. 136-244.000.

Yamazaki, Toshiaki; Nakadate, Takanori; Kitahara, Kenichi; Fujimori, Noboru; Kobayashi, Morio; and Shimosaki, Ryuji, to Konishiroku Photo Industry Co., Ltd. Photographic polyester supports with copolymer subbing layer. 4,571,379, Cl. 430-534.000.

Yamazoe, Hiroshi: *See*—
Ito, Masaki; and Yamazoe, Hiroshi, 4,570,601, Cl. 123-468.000.

Yambe, Teluo: *See*—
Kubota, Hitoshi; Yambe, Teluo; Ishii, Akira; and Takahashi, Toshiyuki, 4,571,006, Cl. 303-6.00C.

Yanagisawa, Kaoru: *See*—
Shima, Yoshiharu; Miyahara, Masaaki; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,571,169, Cl. 425-451.900.

Yanagisawa, Takashi: *See*—
Tsujii, Gen; and Yanagisawa, Takashi, 4,571,669, Cl. 363-144.000.

Yanagishima, Fumiya; Sasaki, Toru; Hira, Takaaki; Abe, Hideo; Tahara, Kouichi; and Shimoyama, Yuji, to Kawasaki Steel Corporation. Method for continuous annealing of a metal strip. 4,571,274, Cl. 148-156.000.

Yanashima, Tadahiko: *See*—
Miwa, Hirohide; Hayashi, Hajime; Shimura, Takai; Yanashima, Tadahiko; Kawabe, Kenji; and Iida, Atsuo, 4,570,488, Cl. 73-626.000.

Yang, Tai-Her. Movable wrench equipped with movable claw which is driven and rotated by adjusting rod. 4,570,515, Cl. 81-166.000.

Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Design of bottom blocks for electromagnetic casting. 4,570,696, Cl. 164-467.000.

Yarwood, John C.: *See*—
Gaule, Gerhart K.; Yarwood, John C.; and Tyler, Derek E., 4,570,699, Cl. 164-503.000.

Yashiki, Yuichi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive layer comprising silicone compound leveling agent. 4,571,371, Cl. 430-62.000.

Yashima, Nobuyoshi: *See*—
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,571,125, Cl. 405-224.000.

Yasuda, Keiryo, to Fuji Xerox Co., Ltd. Scale factor changing mechanism for copying machine. 4,571,065, Cl. 355-11.000.

Yasui, Tadahiko; Ito, Shizuo; Horiki, Akira; Yamada, Hajime; and Usami, Takashi, to Nippon Telegraph & Telephone Public Corporation; Nippon Electronic Co., Ltd.; Hitachi, Ltd.; Oki Electric Industry, Ltd.; and Fujitsu Limited. Composite concentration system. 4,571,721, Cl. 370-56.000.

Yata, Kei, to Matsushita Electric Industrial Co., Ltd. Telephone answering machine. 4,571,459, Cl. 179-6.130.

Yates, Donald B.: *See*—
Ferris, Ray L.; and Yates, Donald B., 4,570,816, Cl. 220-314.000.

Yeater, Robert P., to Mobay Chemical Corporation. Novel polyester polyols and mixtures made therefrom. 4,571,304, Cl. 252-182.000.

Yew, Kwang; and Mitchell, Ron, to Allied Corporation. Evaporation canister flow rate valve. 4,570,902, Cl. 251-129.150.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier circuit with distortion cancellation function. 4,571,553, Cl. 330-149.000.

Yonezawa, Susumu: *See*—
Kato, Kikuji; Watabe, Akinori; Ukita, Hiroo; and Yonezawa, Susumu, 4,571,715, Cl. 369-45.000.

Yonker, John F.: *See*—
Masica, Michael T.; Wong, Albert C.; and Yonker, John F., 4,570,667, Cl. 137-117.000.

Yoshida, Kaneki: *See*—
Shinozaki, Michio; and Yoshida, Kaneki, 4,571,598, Cl. 346-76.0PH.

Yoshida, Kazuhiro; and Murakami, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic vehicle control system. 4,570,441, Cl. 60-421.000.

Yoshida, Kimiyoshi: *See*—
Tamaru, Hideshi; Shikakura, Kunio; Kitamura, Nobuo; Yoshida, Kimiyoshi; and Sakano, Akio, 4,571,454, Cl. 178-18.000.

Yoshida Kogyo K.K.: *See*—
Hatagishi, Shingo, 4,570,335, Cl. 29-768.000.
Ishii, Susumu, 4,570,309, Cl. 24-429.000.
Watanabe, Kozo; Kawada, Masashi; and Okada, Yozo, 4,570,422, Cl. 53-557.000.

Yoshida, Syotaroh: *See*—
Takaoka, Michio; Mohtai, Tsuneaki; Yoshida, Syotaroh; and Watanabe, Kazuo, 4,571,453, Cl. 174-110.00A.

Yoshida, Tsunemasa; Wakabayashi, Toshio; and Matsumoto, Keizo, to Teijin Limited. Composition for curing respiratory diseases. 4,571,334, Cl. 424-95.000.

Yoshikawa, Shoji, to Olympus Optical Co., Ltd. Temperature control device for a semiconductor laser. 4,571,728, Cl. 372-36.000.

Yoshimi, Akiro: *See*—
Takemi, Akio; Yoshimi, Akiro; and Kawai, Takayoshi, 4,570,450, Cl. 62-199.000.

Yoshioka, Masahiro; Murakami, Masahiro; Irie, Yoichiro; Nakanishi, Tsugio; Tsutsui, Eiji; Iwao, Noriyuki; Hirobe, Junichi; and Wakikaido, Takahiro, to Mita Industrial Co., Ltd. Electrostatic copying process and apparatus. 4,571,062, Cl. 355-8.000.

Yoshizawa, Kenji: *See*—
Maeda, Susumu; Taki, Masakazu; and Yoshizawa, Kenji, 4,571,479, Cl. 219-124.340.

Yoshizawa, Takeshi, to Fujitsu Limited. Apparatus for cleaning glass masks. 4,570,279, Cl. 15-97.00R.

Yost, Kenneth J. Snowplow and blade having triangular rotatable cutting block teeth. 4,570,366, Cl. 37-232.000.

Younes, Usama E., to Atlantic Richfield Company. Char-forming polymer, moldable composition and method. 4,571,418, Cl. 525-148.000.

Ypsilon Limited: *See*—
Sacerdote, Giacomo M., 4,570,358, Cl. 34-54.000.

Ytong AG: *See*—
Specht, Manfred, 4,570,443, Cl. 60-670.000.

Yunoki, Yutaka: *See*—
Tamagawa, Akira; Kimura, Tadashi; Mizokami, Kazunori; Kikuchi, Juro; Yunoki, Yutaka; and Nakamura, Kazuo, 4,571,630, Cl. 358-226.000.

Z.S. Electroniques (Proprietary) Limited: *See*—
Hodgkinson, Alec J., 4,571,596, Cl. 343-860.000.

Zagler, Wolfgang; and Oberleitner, Wolfgang, to Siemens Aktiengesellschaft. Device for forming Braille tactile display. 4,571,190, Cl. 434-114.000.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; and Suto, Ken, 4,571,727, Cl. 372-4.000.

Zaikonnikova, Irina V.: *See*—
Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased, 4,571,403, Cl. 514-387.000.

Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-Aminodicarboxylic acid aminoalkenoic acid ester amides. 4,571,308, Cl. 260-112.50R.

Zanzottera, Daniele: *See*—
Mantellina, Calogero; Zanzottera, Daniele; and Gelmetti, Marco, 4,571,676, Cl. 364-200.000.

Zaruba, John V.; Meyer, Burton C.; and Hanson, Steven P., to Marvin Glass & Associates. Express delivery playset. 4,571,205, Cl. 446-230.000.

Zaruba, John V.; Andersen, Michael A.; and Meyer, Burton C., to Marvin Glass & Associates. Toy playset elevator. 4,571,210, Cl. 446-424.000.

Zavody silnoproude elektrotechniky koncern Praha MEZ Mohelnice, koncernovy podnik: *See*—
Sitta, Jaroslav; and Schiebl, Antonin, 4,570,504, Cl. 74-411.000.

Zenith Electronics Corporation: *See*—
Czech, John F.; Drucker, Irving M.; and Inaba, Akinobu, 4,570,892, Cl. 248-372.100.
Dobrovolny, Pierre, 4,571,560, Cl. 333-174.000.

Zentgraf, Helmut; and Fricke, Gunter, to Kali und Salz AG. Method of and arrangement for electrostatic separation of paper- and synthetic plastic material-containing mixtures. 4,570,861, Cl. 241-24.000.

Ziegler, Klaus; Zund, Peter; Gees, Jurg; and Mader, Josef, to Wild Heerbrugg Aktiengesellschaft. Mount for an optical component. 4,571,028, Cl. 350-287.000.

Ziemek, Gerhard; and Schippl, Klausdieter, to Kabelmetal Electro GmbH. Conduit system for transporting low temperature fluids. 4,570,678, Cl. 138-113.000.

Zima, John P. Earthquake resistant self-balancing dome structure. 4,570,395, Cl. 52-83.000.

Zimakova, Irina E.; Valimukhametova, Dania A.; Zaikonnikova, Irina V.; Bogoyavlensky, Vladimir F.; Kaverina, Natalya V.; Kamburg, Roman A.; Karpov, Anatoly M.; Khmelnitsky, Lenor I.; Lebedev, Oleg V.; Epishina, Lia V.; Lapshina, Lidia V.; Suvorova, Ljudmila I.; Darinsky, Nikolai V.; and Novikov, Sergei S., deceased (by Sevostyanova, Valentina V., Alexandr S. Novikov, Sergei S. Novikov, administrators), to Institut Organicheskoi Khimii Imeni N.D. Zelinskogo Akademii Nauk SSSR. Antianginal medicated compound. 4,571,403, Cl. 514-387.000.

Zimmerly, Robert D., to Ladish Co. Aseptic valve with unitary valve seat and lip seals. 4,570,665, Cl. 137-240.000.

Zimmerman, Melvin M., to Superior Walls. Sprayed concrete basement structure. 4,570,398, Cl. 52-169.110.

Zimmerman, Paton M., Jr.: *See*—
Baluch, Donald T.; and Zimmerman, Paton M., Jr., 4,571,319, Cl. 264-40.100.

Zimmermann, Kuno P.: *See*—
Gnerlich, Hans R.; and Zimmermann, Kuno P., 4,571,556, Cl. 331-78.000.

Zimmern, Bernard. Control slide for a screw volumetric machine and a machine equipped therewith. 4,571,166, Cl. 418-195.000.

Zimmern, Bernard: *See*—
Langouet, Luc, 4,570,451, Cl. 62-228.300.

Zingarelli, Valerio: *See*—
Pirani, Giancarlo; and Zingarelli, Valerio, 4,571,732, Cl. 375-12.000.

Zinser, Heiner: *See*—
Beier, Stefan; Boeckh, Franz-Xaver; Braun, Anton; Brunner, Thomas; Hoffmann, Dieter; Kiess, Peter; Wagner, Bernd; and Zinser, Heiner, 4,571,182, Cl. 433-79.000.

Zinser Textilmaschinen GmbH: *See*—
Guttler, Hermann; and Lagemann, Bernd, 4,570,429, Cl. 57-81.000.
Igel, Wolfgang, 4,570,431, Cl. 57-275.000.
Nickolay, Helmut, 4,570,433, Cl. 57-305.000.

Znojkiewicz, Maciej E., to Northern Telecom Limited. Aperture-coupled microwave apparatus. 4,571,564, Cl. 333-230.000.

Zund, Peter: *See*—
Ziegler, Klaus; Zund, Peter; Gees, Jurg; and Mader, Josef, 4,571,028, Cl. 350-287.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF FEBRUARY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ben-Dror, Jonathan: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, Re. 32,083, Cl. 62-476.000.

Bourne, Joseph: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, Re. 32,083, Cl. 62-476.000.

Eshel Residual Energy for Cooling and Heating Ltd.: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, Re. 32,083, Cl. 62-476.000.

Goetz, Richard, to National Distillers and Chemical Corporation. Glycol aldehyde and ethylene glycol processes. Re. 32,084, Cl. 568-862.000.

Kimchi, Yigal: *See*—
Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, Re. 32,083, Cl. 62-476.000.

National Distillers and Chemical Corporation: *See*—
Goetz, Richard, Re. 32,084, Cl. 568-862.000.

Vardi, Isaih; Bourne, Joseph; Ben-Dror, Jonathan; and Kimchi, Yigal, to Eshel Residual Energy for Cooling and Heating Ltd. Reduction of superheating. Re. 32,083, Cl. 62-476.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Beaver, William D.; and Sykes, Roger A., to Bell Telephone Laboratories, Incorporated. Monolithic piezoelectric filter having mass loaded electrodes for resonation regions acoustically coupled together. B1 3,564,463, 2-18-86, Cl. 333-191.000.

Bell Telephone Laboratories, Incorporated: *See*—
Beaver, William D.; and Sykes, Roger A., B1 3,564,463, Cl. 333-191.000.

Graham, Kenneth W.: *See*—
Norton, Edward J.; and Graham, Kenneth W., B1 4,288,929, Cl. 36-69.000.

New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J.; and Graham, Kenneth W., B1 4,288,929, Cl. 36-69.000.

Norton, Edward J.; and Graham, Kenneth W., to New Balance Athletic Shoe, Inc. Motion control device for athletic shoe. B1 4,288,929, 2-18-86, Cl. 36-69.000.

Sykes, Roger A.: *See*—
Beaver, William D.; and Sykes, Roger A., B1 3,564,463, Cl. 333-191.000.

LIST OF DESIGN PATENTEES

Abrams, Julian M., to Plessey Overseas Limited. Telephone handset. 282,658, 2-18-86, Cl. D14-63.000.

Abrams, Julian M., to Plessey Overseas Limited. Telephone handset. 282,659, 2-18-86, Cl. D14-63.000.

Addington, William F. Chain end interconnecting clasp. 282,648, 2-18-86, Cl. D11-87.000.

Allen, James H., to 'totes', incorporated. Expandable travel bag. 282,602, 2-18-86, Cl. D3-71.000.

Alsup, James D., Jr.: *See*—
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,681, Cl. D24-4.000.
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,682, Cl. D24-4.000.
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,683, Cl. D24-4.000.

American Hospital Supply Corporation: *See*—
Gallagher, Abigail H.; and Warren, Gary E., 282,616, Cl. D7-40.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 282,601, Cl. D3-71.000.

Aoyama, Nobuhisa, to Tokyo Shibaura Denki Kabushiki Kaisha. Microprocessor. 282,664, 2-18-86, Cl. D14-100.000.

Arigaya, Fujio, to Takara Co., Ltd. Toy vehicle. 282,675, 2-18-86, Cl. D21-136.000.

Arigaya, Fujio, to Takara Co., Ltd. Toy vehicle chassis. 282,677, 2-18-86, Cl. D21-141.000.

Arken, Inc.: *See*—
Seely, James R., 282,611, Cl. D6-409.000.

Asian Star U.S.A. Inc.,: *See*—
Chiang, Hsin-Hui, 282,597, Cl. D2-240.000.
Chiang, Hsin-Hui, 282,598, Cl. D2-252.000.

Aspen Laboratories, Inc.: *See*—
Cline, Albert L., 282,684, Cl. D24-29.000.

Bangert, Heinrich. Child's sleeping bag. 282,596, 2-18-86, Cl. D2-25.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 282,601, Cl. D3-71.000.

Bartlett, Randall N.: *See*—
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,681, Cl. D24-4.000.
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,682, Cl. D24-4.000.
Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., 282,683, Cl. D24-4.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,631, 2-18-86, Cl. D9-355.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,632, 2-18-86, Cl. D9-355.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,633, 2-18-86, Cl. D9-375.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,634, 2-18-86, Cl. D9-375.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,635, 2-18-86, Cl. D9-376.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,636, 2-18-86, Cl. D9-376.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,637, 2-18-86, Cl. D9-376.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,638, 2-18-86, Cl. D9-399.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,639, 2-18-86, Cl. D9-403.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,640, 2-18-86, Cl. D9-403.000.

Beaver, Ted L.; and Conrad, George R., to Continental Plastic Containers, Inc. Container body for liquids and the like. 282,641, 2-18-86, Cl. D9-408.000.

Bell, Randall P.: *See*—
Scheid, William J.; and Bell, Randall P., 282,662, Cl. D14-100.000.

Blamberg, Siegmar R. School cafeteria sound level monitor. 282,646, 2-18-86, Cl. D10-114.000.

Bobo, Jimmy R. Wallpaper hanger. 282,622, 2-18-86, Cl. D8-14.000.

Bomanite Corporation: *See*—
Nasvik, Jonathan P., 282,623, Cl. D8-45.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Soft-sided carry-on luggage. 282,601, 2-18-86, Cl. D3-71.000.

Boyles, Edward K. Thumb pusher for loading ammunition into a magazine. 282,680, 2-18-86, Cl. D22-99.000.

Braun, Morris, to W. Braun Company. Jar, or similar article. 282,630, 2-18-86, Cl. D9-353.000.

Buenz, Robert, Jr. Fluid chilling unit for printing press. 282,670, 2-18-86, Cl. D18-22.000.

Bulgari, Marina, to Marina B Creation S.A. Earring. 282,647, 2-18-86, Cl. D11-40.000.

Cafolla, Lisa A. Stuffed rabbit figure. 282,678, 2-18-86, Cl. D21-187.000.

Caren, Barry L. Speaker grille. 282,657, 2-18-86, Cl. D14-39.000.

Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., to Syntex (U.S.A.) Inc. Operatory module for a health treatment facility. 282,681, 2-18-86, Cl. D24-4.000.

Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., to Syntex (U.S.A.) Inc. Operatory module for a health treatment facility. 282,682, 2-18-86, Cl. D24-4.000.

Case, Robert; Kennedy, Joe H.; Bartlett, Randall N.; and Alsup, James D., Jr., to Syntex (U.S.A.) Inc. Operatory module system for a health treatment facility. 282,683, 2-18-86, Cl. D24-4.000.

Cavalli, Alfredo. Food processor. 282,620, 2-18-86, Cl. D7-384.000.

Chiang, Hsin-Hui, to Asian Star U.S.A. Inc.,. Hat or similar article. 282,597, 2-18-86, Cl. D2-240.000.

Chiang, Hsin-Hui, to Asian Star U.S.A., Inc. Sun visor or similar article. 282,598, 2-18-86, Cl. D2-252.000.

Cline, Albert L., to Aspen Laboratories, Inc. Electrosurgical pencil holster. 282,684, 2-18-86, Cl. D24-29.000.

Cole-Palmer Instrument Company: *See*—
Hogan, Lawrence R., 282,617, Cl. D7-52.000.

Collins, Thomas: *See*—
Perry, Steven B.; and Collins, Thomas, 282,654, Cl. D13-41.000.

Collister, Kenneth D., to Miles Laboratories, Inc. Reflectance colorimeter. 282,644, 2-18-86, Cl. D10-46.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsumoto, Susumu, 282,673, Cl. D21-65.000.

Conlee, Carl S., Jr. Abacus. 282,669, 2-18-86, Cl. D18-6.000.

Conrad, George R.: *See*—
Beaver, Ted L.; and Conrad, George R., 282,631, Cl. D9-355.000.
Beaver, Ted L.; and Conrad, George R., 282,632, Cl. D9-355.000.
Beaver, Ted L.; and Conrad, George R., 282,633, Cl. D9-375.000.
Beaver, Ted L.; and Conrad, George R., 282,634, Cl. D9-375.000.
Beaver, Ted L.; and Conrad, George R., 282,635, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,636, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,637, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,638, Cl. D9-399.000.
Beaver, Ted L.; and Conrad, George R., 282,639, Cl. D9-403.000.
Beaver, Ted L.; and Conrad, George R., 282,640, Cl. D9-403.000.
Beaver, Ted L.; and Conrad, George R., 282,641, Cl. D9-408.000.

Continental Plastic Containers, Inc.: *See*—
Beaver, Ted L.; and Conrad, George R., 282,631, Cl. D9-355.000.
Beaver, Ted L.; and Conrad, George R., 282,632, Cl. D9-355.000.
Beaver, Ted L.; and Conrad, George R., 282,633, Cl. D9-375.000.
Beaver, Ted L.; and Conrad, George R., 282,634, Cl. D9-375.000.
Beaver, Ted L.; and Conrad, George R., 282,635, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,636, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,637, Cl. D9-376.000.
Beaver, Ted L.; and Conrad, George R., 282,638, Cl. D9-399.000.
Beaver, Ted L.; and Conrad, George R., 282,639, Cl. D9-403.000.
Beaver, Ted L.; and Conrad, George R., 282,640, Cl. D9-403.000.
Beaver, Ted L.; and Conrad, George R., 282,641, Cl. D9-408.000.

CPG Products Corp.: *See*—
Effler, Timothy A.; and Goldberg, Dale I., 282,676, Cl. D21-136.000.

Crinklaw, William R. Chile pepper wreath. 282,649, 2-18-86, Cl. D11-120.000.

Crowe, Scott D. Frame support for a combined seat and table unit. 282,608, 2-18-86, Cl. D6-337.000.

De Fuccio, Robert, to Simmons Universal Corporation. Chair. 282,606, 2-18-86, Cl. D6-334.000.

De Fuccio, Robert, to Simmons Universal Corporation. Table. 282,613, 2-18-86, Cl. D6-484.000.

Effler, Timothy A.; and Goldberg, Dale I., to CPG Products Corp. Toy vehicle. 282,676, 2-18-86, Cl. D21-136.000.

Ellsworth, Suzanne R. Clock or similar article. 282,643, 2-18-86, Cl. D10-22.000.

Encon Products, Inc.: *See*—
Simpson, Harold G.; and Tondelli, Juan B., 282,627, Cl. D8-366.000.

FCF Limited: *See*—
McBrien, Roderick J., 282,618, Cl. D7-323.000.

Fitzgerald, James F.; Raymer, Doyle; and Seltz, Charles K., to King-Seeley Thermos Company. Barbecue grill. 282,619, 2-18-86, Cl. D7-332.000.

Franklin, James; Palmer, William E.; and Seabolt, Keith, to Victory Lane, Inc. Restaurant building. 282,685, 2-18-86, Cl. D25-18.000.

Frey, Helmut. Pair of motorcycling boots. 282,599, 2-18-86, Cl. D2-272.000.

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General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi, 282,660, Cl. D14-68.000.
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Goldberg, Dale I.: *See*—
Effler, Timothy A.; and Goldberg, Dale I., 282,676, Cl. D21-136.000.

Gorhalls Forsaljnings AB: *See*—
Hallengren, Goran L., 282,600, Cl. D3-35.000.
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Haas, Robert T.: *See*—
Sims, Dewey M., Jr.; and Haas, Robert T., 282,665, Cl. D14-108.000.

Haas, Ulrich J., to Optyl Eyewear Fashion International Corporation. Eyeglass frame. 282,668, 2-18-86, Cl. D16-102.000.

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Hartmeister, Ruben J. Punch. 282,624, 2-18-86, Cl. D8-52.000.

Harvey, Franklin D. Comb. 282,688, 2-18-86, Cl. D28-31.000.

Herold, Gerald C.: *See*—
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Kaku, Noriaki; Nakamura, Haruzi; Ishida, Kazuo; and Tanaka, Yasuhiko, 282,655, Cl. D14-4.000.

Ishii, Yoshiyasu: *See*—
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John Manufacturing Limited: *See*—
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Kaku, Noriaki; Nakamura, Haruzi; Ishida, Kazuo; and Tanaka, Yasuhiko, to Matsushita Electric Industrial Co., Ltd. Telephone answering machine. 282,655, 2-18-86, Cl. D14-4.000.

Kennedy, Joe H.: *See*—
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Bulgari, Marina, 282,647, Cl. D11-40.000.

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McMahon, Gordon E. Grille for vehicle light fixture. 282,687, 2-18-86, Cl. D26-139.000.
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Mohri, Akinari, to Sony Corporation. Combined video camera and video tape recorder. 282,656, 2-18-86, Cl. D14-5.000.
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Nasvik, Jonathan P., to Bomanite Corporation. Tool for imprinting fishscale granite patterns in fresh concrete. 282,623, 2-18-86, Cl. D8-45.000.
Nissan Motor Co., Ltd.: *See*—
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Palmer, Dennis J. Settee. 282,610, 2-18-86, Cl. D6-381.000.
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Papsdorf, John, to PTL Engineering. Circle drafting template. 282,671, 2-18-86, Cl. D19-39.000.
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Roberts, Doreen N., 282,651, Cl. D11-158.000.
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Purity Company Pty. Ltd., The: *See*—
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Raymer, Doyle: *See*—
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Seabolt, Keith: *See*—
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Sears Manufacturing Co.: *See*—
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Seely, James R., to Arken, Inc. Freestanding display rack for rolled material. 282,611, 2-18-86, Cl. D6-409.000.
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Schultz, William H.; and Svetlik, Kenneth N., 282,625, Cl. D8-64.000.
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Stafford, Rodney A. Bottle. 282,629, 2-18-86, Cl. D9-349.000.
Stulik, Edward, to Sears Manufacturing Co. Seat. 282,609, 2-18-86, Cl. D6-356.000.
Svetlik, Kenneth N.: *See*—
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Arigaya, Fujio, 282,675, Cl. D21-136.000.
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Tanaka, Yasuhiko: *See*—
Kaku, Noriaki; Nakamura, Haruzi; Ishida, Kazuo; and Tanaka, Yasuhiko, 282,655, Cl. D14-4.000.
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Franklin, James; Palmer, William E.; and Seabolt, Keith, 282,685, Cl. D25-18.000.
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Wagner, Peter E. Fishing tool. 282,679, 2-18-86, Cl. D22-31.000.
Warren, Gary E.: *See*—
Gallagher, Abigail H.; and Warren, Gary E., 282,616, Cl. D7-40.000.
Whitaker, Wiley M. Combined hand scrubber and scraper. 282,604, 2-18-86, Cl. D4-118.000.
Wright Line Inc.: *See*—
Latino, Richard M., 282,691, Cl. D34-21.000.
Yuen, John S., to John Manufacturing Limited. Penlight. 282,686, 2-18-86, Cl. D26-49.000.
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Bradford, Norman G.; and Bradford, Lowell G. Plum tree (June Beaut). 5,662, 2-18-86, Cl. 38.000.

Bradford, Norman G. Nectarine tree (July Red). 5,663, 2-18-86, Cl. 41.000.

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CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 18, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 102

202	4,570,540
216	4,570,541

CLASS 104

119	4,570,542
300	4,570,543

CLASS 105

165	4,570,544
354	4,570,545

CLASS 106

1.17	4,571,268
27	4,571,267
273 R	4,571,269

CLASS 108

51.1	4,570,546
141	4,570,547

CLASS 109

66	4,570,548

CLASS 110

106	4,570,549
180	4,570,550
263	4,570,551
347	4,570,552

CLASS 111

6	4,570,553
85	4,570,554

CLASS 112

67	4,570,555
121.15	4,570,556
147	4,570,557
162	4,570,558
266.2	4,570,559
273	4,570,560
454	4,570,561

CLASS 114

39	4,570,562
140	4,570,563
221 R	4,570,564

CLASS 118

34	4,570,566
64	4,570,567
69	4,570,568
410	4,570,569
612	4,570,570
642	4,570,571
657	4,570,572

CLASS 119

1	4,570,573
17	4,570,574
52 R	4,570,575
73	4,570,576
102	4,570,577

CLASS 123

1 A	4,570,578
41.02	4,570,579
52 B	4,570,580
90.18	4,570,581
90.46	4,570,582
179 K	4,570,583
179 SE	4,570,584
188 S	4,570,585
192 B	4,570,586
193 P	4,570,587
	4,570,589
198 DB	4,570,588
308	4,570,590
331	4,570,591
339	4,570,592
398	4,570,593
414	4,570,594
418	4,570,595
421	4,570,596
444	4,570,597
445	4,570,598
468	4,570,600
	4,570,601
	4,570,602
489	4,570,599
514	4,570,604
570	4,570,603
576	4,570,605

CLASS 124

24 R	4,570,606
56	4,570,607
89	4,570,608

CLASS 125

13 R	4,570,609

CLASS 126

39 E	4,570,610
288	4,570,611
360 A	4,570,612

CLASS 128

1 R	4,570,613
11	4,570,614
28	4,570,615
36	4,570,616
52	4,570,617
69	4,570,618
78	4,570,619
80 A	4,570,620
84 C	4,570,621
90	4,570,622
92 B	4,570,623
92 EB	4,570,624
92 G	4,570,625
132 D	4,570,627
	4,570,628
132 R	4,570,626
156	4,570,629
203.15	4,570,630
204.23	4,570,631
305	4,570,632
325	4,570,633
328	4,570,634
380	4,570,635
419 R	4,570,636
639	4,570,637
665	4,570,638
718	4,570,639
741	4,570,640
774	4,570,641
785	4,570,642

CLASS 131

94	4,570,643
109 R	4,570,644
175	4,570,645
185	4,570,646
237	4,570,647
276	4,570,648
336	4,570,649
349	4,570,650

CLASS 132

9	4,570,651
84 R	4,570,652
91	4,570,653

CLASS 133

1 A	4,570,654
3 A	4,570,655

CLASS 134

5	4,571,270
21	4,571,271

CLASS 136

244	4,571,446
252	4,571,447
259	4,571,448

CLASS 137

13 4,570,656
39 4,570,657
68.2 4,570,658
72 4,570,659
114 4,570,660
115 4,570,661
117 4,570,662
4,570,667
119 4,570,663
202 4,570,664
240 4,570,665
512.1 4,570,666
512.2 4,570,668
528 4,570,669
553 4,570,670
596 4,570,671
596.13 4,570,672
615 4,570,673
624.18 4,570,674
805 4,570,675
870 4,570,676
881 4,570,677

CLASS 138

113 4,570,678
149 4,570,679
4,570,680

CLASS 139

1 C 4,570,682
1 E 4,570,681
194 4,570,683
449 4,570,684

CLASS 141

61 4,570,685
286 4,570,686

CLASS 144

378 4,570,687

CLASS 148

11.5 A 4,571,272
16 4,571,273
156 4,571,274
175 4,571,275

CLASS 150

134 4,570,688

CLASS 152

209 R 4,570,689
332.1 4,570,691
564 4,570,690

CLASS 156

89 4,571,276
96 4,571,277
108 4,571,278
270 4,571,279
329 4,571,280
580 4,571,281

CLASS 162

47 4,571,282
344 4,571,283

CLASS 164

56.1 4,570,692
112 4,570,693
158 4,570,694
463 4,570,695
467 4,570,696
484 4,570,697
498 4,570,698
503 4,570,699

CLASS 165

134.1 4,570,700
158 4,570,701
159 4,570,702
162 4,570,703
4,570,704

CLASS 166

77 4,570,705
77.5 4,570,706
214 4,570,707
244.1 4,570,708
250 4,570,709
4,570,710
272 4,570,711
273 4,570,712
275 4,570,713
278 4,570,714
302 4,570,715
346 4,570,716
362 4,570,717
369 4,570,718

CLASS 169

20 4,570,719
39 4,570,720

CLASS 172

99 4,570,721
311 4,570,722

CLASS 173

116 4,570,723

CLASS 174

35 MS 4,571,449
68 C 4,571,450
68.5 4,571,451
77 R 4,571,452
110 A 4,571,453

CLASS 175

113 4,570,724
329 4,570,725
410 4,570,726

CLASS 177

25 4,570,727
4,570,728
145 4,570,729

CLASS 178

2 R 4,570,565
18 4,[illegible]71,454

CLASS 175

2 A 4,5[illegible]1,455
2 C 4,57[illegible],456
2 EA 4,57[illegible] 457
6.11 4,571 158
6.13 4,571,[illegible]59
16 AA 4,571,460
81 B 4,571,461
84 T 4,571,462
90 B 4,571,463
111 E 4,571,464
170.2 4,571,465

CLASS 180

6.48 4,570,730
19.3 4,570,731
4,570,732
41 4,570,733
79.1 4,570,734
142 4,570,735
143 4,570,736
148 4,570,737
196 4,570,738
216 4,570,739
229 4,570,740
242 4,570,741

CLASS 181

175 4,570,742
200 4,570,743
204 4,570,744
228 4,570,745
242 4,570,746
243 4,570,747
286 4,570,748

CLASS 182

36 4,570,749
44 4,570,750
131 4,570,751
155 4,570,752

CLASS 187

1 R 4,570,753
4,570,754
29 R 4,570,755

CLASS 188

2 F 4,570,756
67 4,570,757
72.3 4,570,758
73.32 4,570,759
73.44 4,570,760
78 4,570,761
82.84 4,570,762
196 D 4,570,763

CLASS 192

0.052 4,570,770
3.29 4,570,764
3.56 4,570,765
18 B 4,570,767
18 R 4,570,766
35 4,570,768
46 4,570,769
58 B 4,570,771
70.18 4,570,772
98 4,570,773
106.2 4,570,774
4,570,775
114 R 4,570,776
134 4,570,777

CLASS 194

239 4,570,778
318 4,570,779

CLASS 198

333 4,570,781
345 4,570,782
347 4,570,783
399 4,570,784
628 4,570,785
781 4,570,780
842 4,570,786

CLASS 200

5 A 4,571,466
6 BA 4,571,467
61.08 4,571,468
61.54 4,571,469
4,571,470
61.58 B 4,571,471

CLASS 203

14 4,571,284

CLASS 204

1 T 4,571,285
15 4,571,286
37.6 4,571,287
98 4,571,288
157.69 4,571,290
157.9 4,571,289
213 4,571,291
412 4,571,292
418 4,571,293

CLASS 206

45.14 4,570,787
83.5 4,570,789
263 4,570,790
326 4,570,791
349 4,570,792
371 4,570,793
394 4,570,794
430 4,570,795
447 4,570,797
449 4,570,796
505 4,570,798
509 4,570,799
545 4,570,800

CLASS 208

11 LE 4,571,294
334 4,571,295

CLASS 209

211 4,571,296
534 4,570,801

CLASS 210

101 4,571,297
498 4,571,298
511 4,571,299
761 4,571,300
788 4,571,301
791 4,571,302

CLASS 211

13 4,570,802
88 4,570,803
126 4,570,804
149 4,570,805
191 4,570,806

CLASS 213

60 4,570,807

CLASS 215

11 R 4,570,808
220 4,570,809
253 4,570,810
343 4,570,811

CLASS 219

9.5 4,571,472
10.55 A 4,571,473
10.55 F 4,571,474
60 A 4,571,475
61.3 4,571,476
69 M 4,571,477
69 R 4,571,478
124.34 4,571,479
146.3 4,571,480
205 4,571,481
237 4,571,482
271 4,571,483
4,571,484
276 4,571,485
354 4,571,486
482 4,571,487
544 4,571,488

CLASS 220

1 T 4,570,812
3 4,570,813
4 F 4,570,814
75 4,570,815
314 4,570,816
339 4,570,818
345 4,570,817
374 4,570,819

CLASS 221

34 4,570,820
194 4,570,821

CLASS 222

14 4,570,822
26 4,570,823
39 4,570,824
45 4,570,825
83 4,570,826
95 4,570,827
100 4,570,828
181 4,570,829
185 4,570,830
199 4,570,831
325 4,570,832
333 4,570,833
566 4,570,834

CLASS 224

36 4,570,835
103 4,570,836

CLASS 225

42 4,570,837
93 4,570,838

CLASS 227

1 4,570,839
8 4,570,840
95 4,570,841

CLASS 228

48 4,570,842
151 4,570,843

CLASS 229

16 D 4,570,844
17 R 4,570,788
33 4,570,845

CLASS 232

35 4,570,846

CLASS 235

379 4,571,489
384 4,571,490

CLASS 236

1 G 4,570,847
12.21 4,570,848
35 4,570,849
49 4,570,850
93 R 4,570,851
4,570,852

CLASS 239

116 4,570,853
189 4,570,854
195 4,570,855
310 4,570,856
382 4,570,857
390 4,570,858
455 4,570,859
478 4,570,860

CLASS 241

24 4,570,861
28 4,570,862
33 4,570,863
252 4,570,864

CLASS 242

35.5 A 4,570,865
35.6 R 4,570,867
47.5 4,570,866
55.53 4,570,868
71.9 4,570,869
75.4 4,570,870
77.2 4,570,871
107 4,570,872
107.4 A 4,570,873
147 R 4,570,874
158 R 4,570,875
188 4,570,876
199 4,570,877
220 4,570,878

CLASS 244

122 AF 4,570,879
4,570,880
134 F 4,570,881

CLASS 246

34 R 4,570,882

CLASS 248

49 4,570,883
68.1 4,570,884
72 4,570,885
186 4,570,886
187 4,570,887
205.1 4,570,888
220.2 4,570,889
274 4,570,890
341 4,570,891
372.1 4,570,892
487 4,570,893
534 4,570,894
575 4,570,895

CLASS 249

27 4,570,896
144 4,570,897

CLASS 250

252.1 4,571,491
303 4,571,492
327.2 4,571,493
370 4,571,494
394 4,571,495
484.1 4,571,496
560 4,571,497
4,571,498

CLASS 251

4 4,570,898
51 4,570,899
58 4,570,900
98 4,570,901
129.12 4,570,903
129.15 4,570,902
129.21 4,570,904

CLASS 252

174.23 4,571,303
182 4,571,304
301.4 H 4,571,305
351 4,571,306
628 4,571,307

CLASS 254

134 4,570,905

CLASS 256

34 4,570,906

CLASS 260

112.5 R 4,571,308
400 4,571,309
973 4,571,310

CLASS 261

64 B 4,571,311

CLASS 264

0.5 4,571,315
1.2 4,571,312
1.5 4,571,313
1.7 4,571,314
22 4,571,316
29.1 4,571,317
30 4,571,318
40.1 4,571,319
4,571,320
43 4,571,321
154 4,571,322

CLASS 266

69 4,570,907
236 4,570,908
281 4,570,909
284 4,570,910

CLASS 267

8 R 4,570,911
64.15 4,570,912

CLASS 269

22 4,570,913
32 4,570,914
295 4,570,915

CLASS 270

52.5 4,570,916
53 4,570,917

CLASS 271

3.1 4,570,918
9 4,570,919
107 4,570,920
178 4,570,922
275 4,570,923

CLASS 272

8 P 4,570,924
67 4,570,925
70.1 4,570,926
73 4,570,927
87 4,570,928
137 4,570,921
4,570,929

CLASS 273

1 E 4,570,930
65 EG 4,570,931
67 A 4,570,932
73 D 4,570,933
143 R 4,570,934
153 R 4,570,935
157 R 4,570,936
220 4,570,937
243 4,570,938
253 4,570,939
296 4,570,940
422 4,570,941

CLASS 277

12 4,570,942
4,570,943
121 4,570,944
197 4,570,945
216 4,570,946
225 4,570,947
226 4,570,948

CLASS 279

1 DA 4,570,949
1 J 4,570,950
1 R 4,570,951
20 4,570,952

CLASS 280

5.24 4,570,954
5.3 4,570,953
11.2 4,570,955
30 4,570,956
32.6 4,570,957
40 4,570,958
43.23 4,570,959
47.13 R 4,570,960
47.18 4,570,961
166 4,570,962
277 4,570,963
403 4,570,964
426 4,570,965
433 4,570,966
656 4,570,967
664 4,570,968
4,570,969
680 4,570,970
4,570,971
714 4,570,972
800 4,570,973
801 4,570,974
806 4,570,975

CLASS 285

4 4,570,976
39 4,570,977
131 4,570,978
223 4,570,979
305 4,570,980
332.3 4,570,981
334 4,570,982
355 4,570,983

CLASS 292

18 4,570,984
262 4,570,985

CLASS 293

117 4,570,986

CLASS 294

1.1 4,570,987
57 4,570,988

CLASS 296

97 G 4,570,991
97 H 4,570,990
97 J 4,570,989
223 4,570,992

CLASS 297

17 4,570,993
19 4,570,994
68 4,570,995
85 4,570,996
349 4,570,997
353 4,570,998
362 4,570,999
465 4,571,000
483 4,571,001

CLASS 299

22 4,571,002
33 4,571,003
34 4,571,004

CLASS 301

63 PW 4,571,005

CLASS 303

6 C 4,571,006
7 4,571,007
33 4,571,008
87 4,571,009
110 4,571,010

CLASS 307

75 4,571,499
154 4,571,500
234 4,571,514
252 R 4,571,501
262 4,571,502
269 4,571,503
290 4,571,504
297 4,571,505
311 4,571,506
350 4,571,507
360 4,571,508
443 4,571,509
449 4,571,510
547 4,571,511
577 4,571,512
4,571,513

CLASS 308

3.5 4,571,011

CLASS 310

42 4,571,515
49 R 4,571,516
68 C 4,571,517
68 R 4,571,518
313 A 4,571,519
327 4,571,520

CLASS 313

402 4,571,521
485 4,571,522
497 4,571,523

CLASS 315

4 4,571,524
39 4,571,525
56 4,571,526
169.4 4,571,527

CLASS 318

138 4,571,528
327 4,571,529
594 4,571,530

CLASS 320

2 4,571,531
4,571,532
25 4,571,533

CLASS 322

2 R 4,571,534

CLASS 323

211 4,571,535
311 4,571,536
326 4,571,537

CLASS 324

58 B 4,571,545
58.5 R 4,571,544
65 R 4,571,538
72 4,571,539
158 D 4,571,541
158 P 4,571,540
4,571,542
425 4,571,543

CLASS 328

61 4,571,546
116 4,571,547
167 4,571,548

CLASS 329

50 4,571,550

CLASS 330

10 4,571,551
47 4,571,552
149 4,571,553
252 4,571,554

CLASS 331

56 4,571,555
78 4,571,556
96 4,571,557
105 4,571,558

CLASS 332

16 R 4,571,549

CLASS 333

17 L 4,571,559
174 4,571,560
184 4,571,561
186 4,571,562
191 B1 3,564,463
212 4,571,563
230 4,571,564

CLASS 335

16 4,571,565
78 4,571,566
128 4,571,567
299 4,571,568

CLASS 336

65 4,571,569
70 4,571,570

CLASS 338

162 4,571,571

CLASS 339

14 R 4,571,012
4,571,013
4,571,014
17 CF 4,571,015
17 D 4,571,016
59 M 4,571,017
60 R 4,571,018
276 R 4,571,019

CLASS 340

347 AD 4,571,573
4,571,574
4,571,576
347 DA 4,571,572
347 DD 4,571,575
347 R 4,571,577
541 4,571,578
566 4,571,579
594 4,571,580
600 4,571,581
677 4,571,582
692 4,571,583
784 4,571,584
4,571,585
825.51 4,571,586
825.53 4,571,587
870.13 4,571,588
870.32 4,571,589

CLASS 343

7 AG 4,571,590
745 4,571,595
754 4,571,591
767 4,571,592
783 4,571,593
840 4,571,594
860 4,571,596

CLASS 346

75 4,571,597
76 PH 4,571,598
140 R 4,571,599
4,571,600
4,571,601
160 4,571,602
4,571,603
161 4,571,604
216 4,571,605

CLASS 350

3.71 4,571,020
6.8 4,571,021
96.19 4,571,024
96.25 4,571,022
4,571,023
99 4,571,025
247 4,571,026
280 4,571,027
287 4,571,028
357 4,571,029
385 4,571,030
426 4,571,031
427 4,571,032
4,571,033
432 4,571,034
433 4,571,035
503 4,571,036
507 4,571,037
515 4,571,038

CLASS 351

160 H 4,571,039
160 R 4,571,040

CLASS 353

10 4,571,041
110 4,571,042

CLASS 354

121 4,571,043
173.11 4,571,044
245 4,571,045
400 4,571,046
403 4,571,047
4,571,048
410 4,571,049
429 4,571,050
468 4,571,051

CLASS 355

3 DD 4,571,060
3 FU 4,571,056
3 R 4,571,053
4,571,057
4,571,058
3 SH 4,571,054
4,571,055
3 TR 4,571,052
4,571,059
8 4,571,061
4,571,062
4,571,063
4,571,064
11 4,571,065
14 D 4,571,068
14 R 4,571,069
14 SH 4,571,067
15 4,571,066
4,571,070
4,571,071
79 4,571,072
89 4,571,073

CLASS 356

51 4,571,074
136 4,571,075
152 4,571,076
239 4,571,077
246 4,571,078
336 4,571,079
345 4,571,080
349 4,571,081
351 4,571,082
358 4,571,083
391 4,571,084
445 4,571,085

CLASS 357

23.4 4,571,606
23.6 4,571,607
28 4,571,608
41 4,571,609
67 4,571,610
81 4,571,611
4,571,612

CLASS 358

36 4,571,613
56 4,571,614
88 4,571,616
107 4,571,617
120 4,571,615
136 4,571,618
160 4,571,619
166 4,571,620
186 4,571,621
194.1 4,571,622
208 4,571,623
212 4,571,624
213 4,571,625
4,571,626
224 4,571,627
4,571,628
225 4,571,629
226 4,571,630
231 4,571,631
260 4,571,632
261 4,571,634
280 4,571,633
284 4,571,635
285 4,571,636
293 4,571,637
4,571,638
314 4,571,639
342 4,571,640

CLASS 360

19.1 4,571,641
37.1 4,571,642
66 4,571,643
90 4,571,644
98 4,571,645
99 4,571,646
105 4,571,647
4,571,648
106 4,571,649
113 4,571,651
114 4,571,650
122 4,571,652
125 4,571,653
130.21 4,571,654
132 4,571,655

CLASS 361

56 4,571,656
95 4,571,659
96 4,571,658
127 4,571,660
283 4,571,661
306 4,571,662
393 4,571,663
433 4,571,664

CLASS 362

225 4,571,665

CLASS 363

15 4,571,666
51 4,571,667
81 4,571,668
144 4,571,669

CLASS 364

171 4,571,670
200 4,571,671
4,571,672
4,571,673
4,571,674
4,571,675
4,571,676
4,571,677
300 4,571,678
4,571,679
410 4,571,680
413 4,571,681
4,571,682
431.05 4,571,683
449 4,571,684
468 4,571,685
474 4,571,686
475 4,571,687
477 4,571,688
481 4,571,689
483 4,571,690
4,571,691
4,571,692
509 4,571,693
513 4,571,694
550 4,571,695
552 4,571,696
561 4,571,697
569 4,571,698
757 4,571,701
900 4,571,699
4,571,700
4,571,702

CLASS 365

154 4,571,703
156 4,571,704
195 4,571,705
200 4,571,706
4,571,707
203 4,571,708
233 4,571,709

CLASS 366

108 4,571,087
127 4,571,086
136 4,571,088
139 4,571,089
270 4,571,090
311 4,571,091
348 4,571,092

CLASS 367

38 4,571,710
88 4,571,711

CLASS 369

44 4,571,712
4,571,713
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